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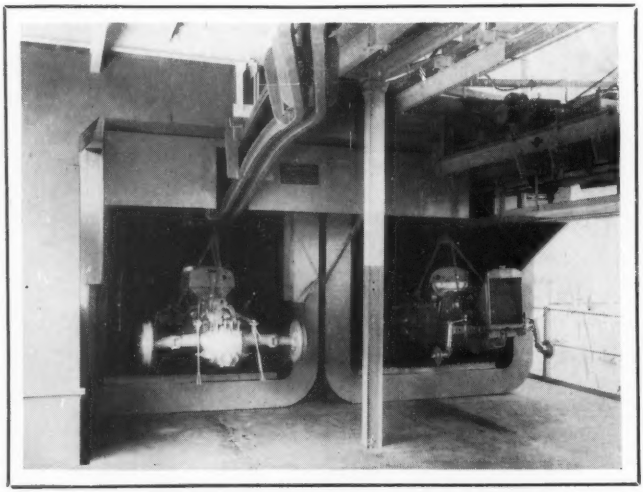

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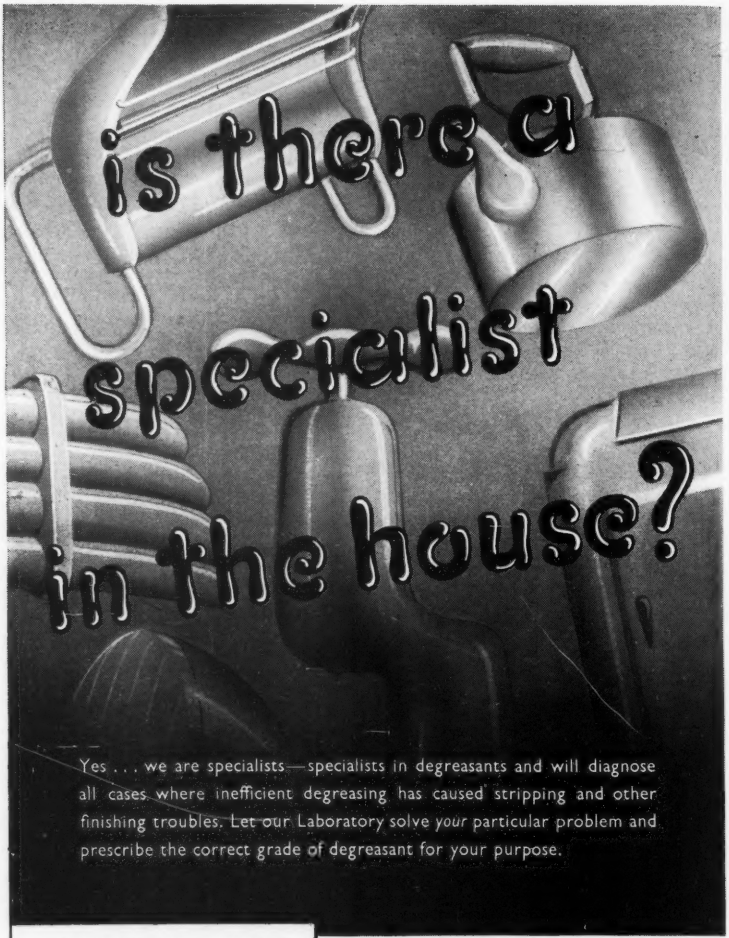

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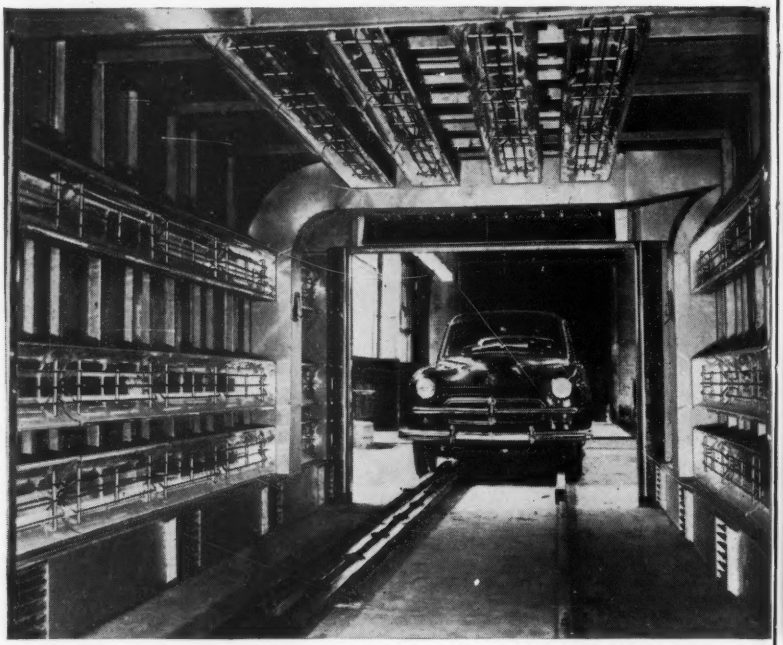

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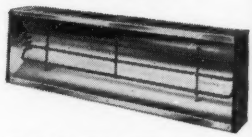

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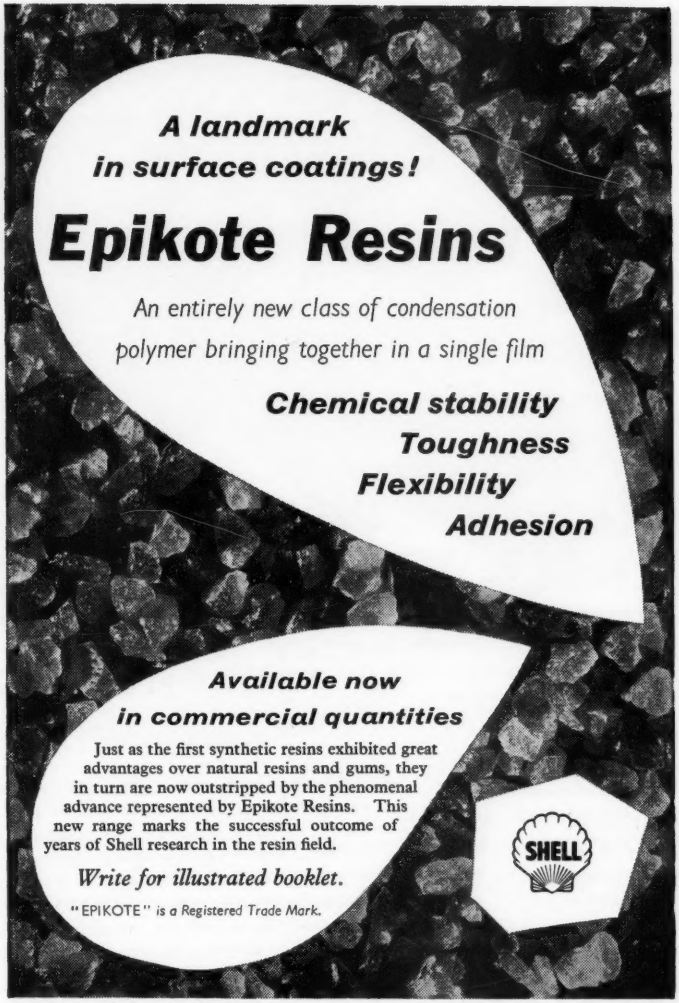
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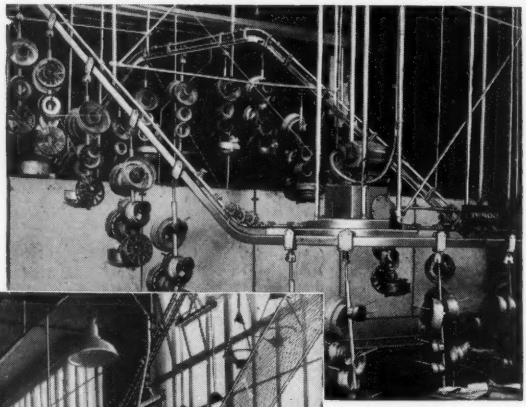
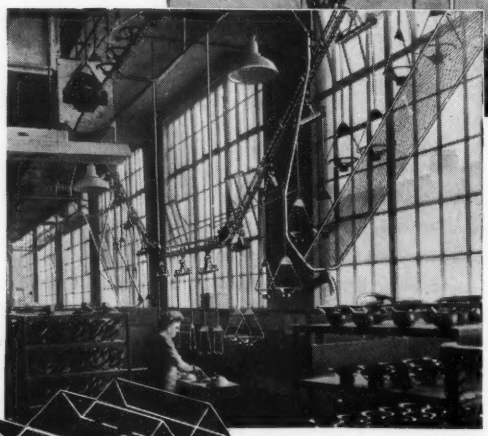
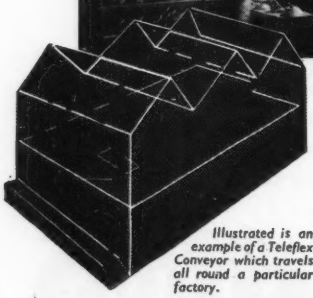


Right:-
Teleflex conveyors form an important aspect of the production system of Messrs. A. C. Delco—Division of General Motors.



Left:-
Teleflex conveyors are important links in the production lines at the works of the Plessey Co. Ltd., Ilford.



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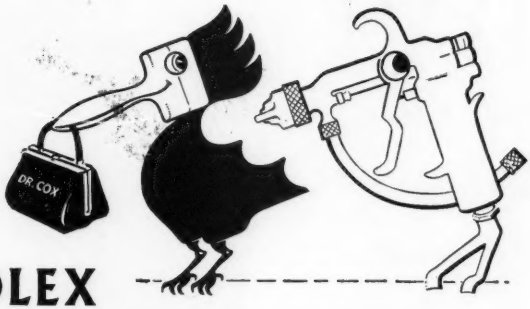

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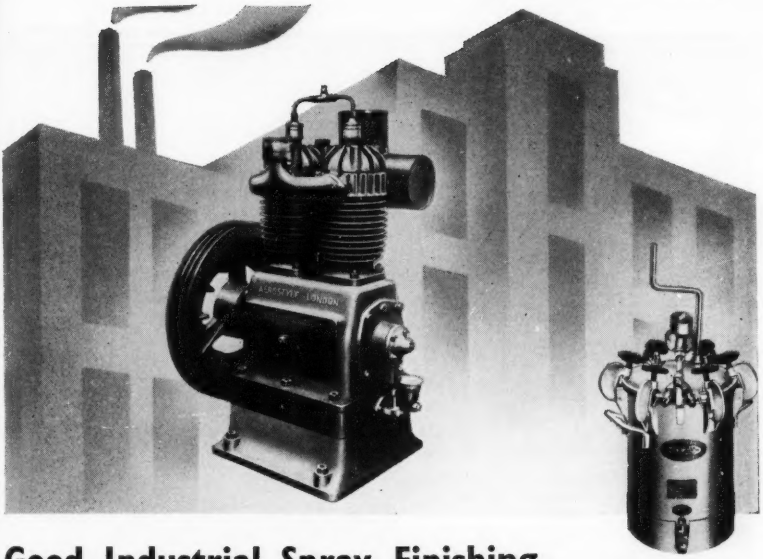

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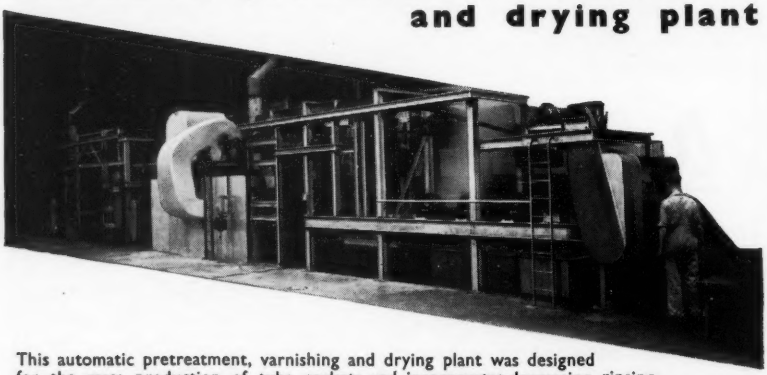

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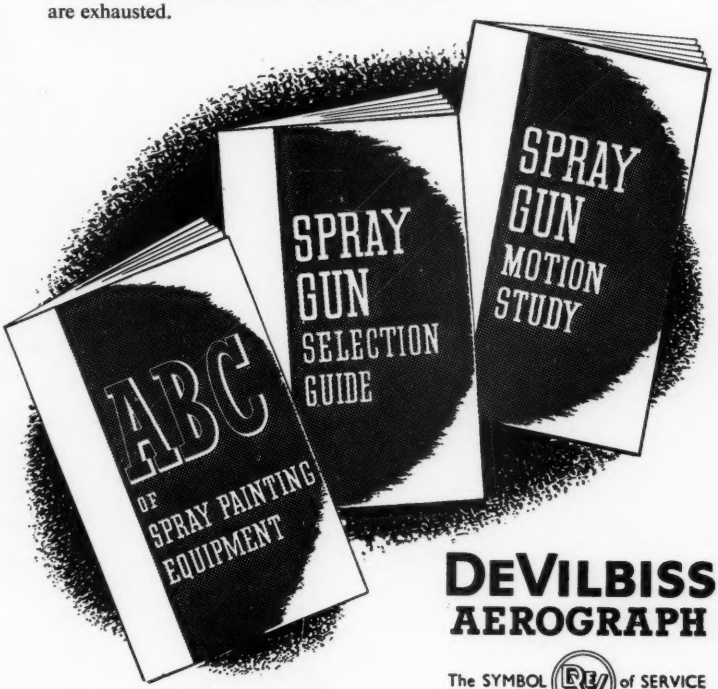

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INDUSTRIAL FINISHING

(Incorporating "CORROSION")

NOVEMBER 1953

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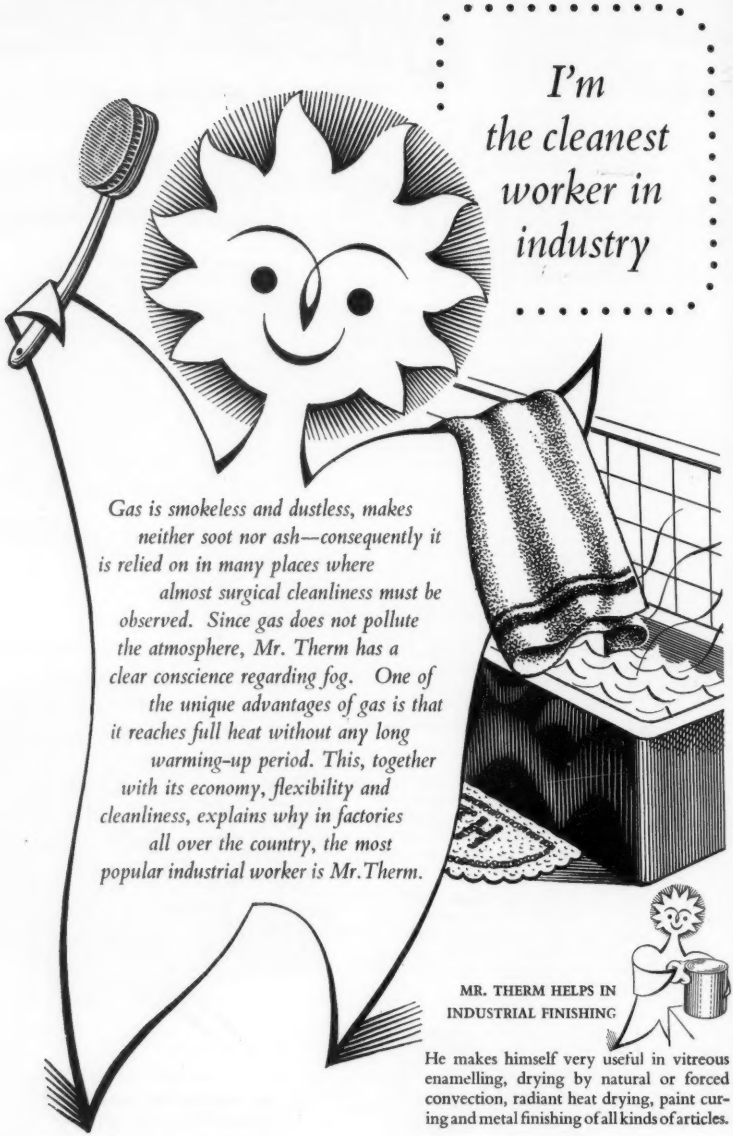

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Industrial Finishing

VOL. 6 NOVEMBER, 1953 NO. 65

FOCUS on FINISH

IN a customers' appraisal of a finished product, eye-appeal plays a most important part. The sellers' market has gone, customers are now buying with greater discrimination. The finishing process used by the manufacturer, whether it is vitreous enamel, organic coating, electrodeposited metal, stainless steel panelling, polished wood or vacuum-coated plastic moulding, lends protection and often beauty. It affects the life of practically every person in every walk of life.

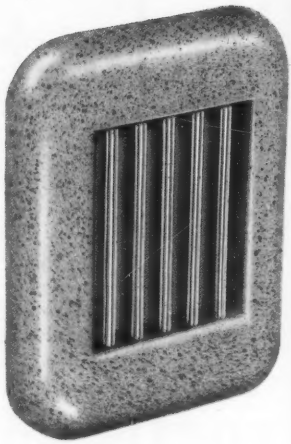
Many things today are taken for granted. We expect the finish of our motor-car to remain in perfect condition despite constant exposure to the elements year after year; we have adding machines, duplicating machines and typewriters in our offices and we expect them to maintain their finish and appearance despite the effects of hard work, and the spilling of nail varnish and eradicator fluids over their surfaces. Every day we see around us the gas fire, the water heater, the refrigerator, the door knocker, the gas cooker, the hair dryer and the products of the costume jewellery manufacturer. How many of us realise what has gone into these products in the way of research and experiment to find a satisfactory finish? How many of us give a thought to the organic coating on the inside of the toothpaste tube, the coating which saves us from being poisoned by metallic salts? How many of us give a thought to the lining of our water softener or the inside of the tea urn?

Most people operate in a very narrow range of vision and experience, mainly confined to their own product or business; they have neither the opportunity nor the contacts to obtain a broader experience yet it could be invaluable to them. Many could learn from the experience of others, often in quite a different line of business. With this fact in mind we are arranging to publish, at intervals over the next year or so, a number of articles which aim to show how different manufacturers have gone about the task of selecting a finish for their products; what research they carried out, what they discovered about public taste and preference in the course of their studies and which types of finish they eventually selected for their products.

The first of these articles (on following pages) deals with gas-fired space-heating equipment and we shall be happy to consider suggestions from readers and manufacturers for other articles, on similar lines, in the same series.

No one interested in finishing need confine his experience of new techniques to his own trade or industry but can benefit from the practices of others. To show something of these practices is one of the aims of this publication. Excellence of finish has always been a tradition of British manufacturers and the responsibility to maintain the tradition is greater than ever now that high quality and reasonable prices are the order of the day. Standards will continue to grow more severe and only by keeping up with every modern development in finishing, can the manufacturer be sure he is marketing a product which can face up to competition in the matter of appearance and durability.

FACTORS AFFECTING THE SELECTION OF A FINISH FOR GAS-FIRED SPACE HEATING EQUIPMENT



This article, based on the experiences of a prominent manufacturer is No. 1 of a series of occasional features dealing with selection of suitable finishes.

THE manufacturer of almost any product which is used in the home and which sells in a competitive market is faced with the problem of selecting a suitable finish for his product. Often there are predetermining factors involved such as the case of the refrigerator or similar article which has a certain type of finish as a matter of tradition but more often than not it devolves on the manufacturer to decide what he will do.

How does the manufacturer decide which colours to select? How does he decide the type of finish, the method of packing, the extent to which which he will use chromium plate or vitreous enamel, or if the metal fittings shall be anodised aluminium or stoved paint? In an attempt to find the answers to these questions we decided to approach a number of makers of different products. For a first approach we selected a maker of space-heating equipment, Radiant Heating Ltd., of Radiant Works, Barnsbury Park, London, N.1.

Radiant Heating manufacture a wide range of heating equipment some of which is illustrated on the pages of this article; their products range from small floor-type space heaters, through convector heaters and suspended gas-fired types to the hotel chef's salamander and the fan-driven factory heater.

In the course of their long experience this firm has experimented with many types and methods of finishing and the regular line of products turned out today bears a selected range of colours and finishes which experience has proved to be best for each particular job. Briefly, the bulk of the work is in vitreous enamel, a little in stoved sheet metal and a small number of parts in stainless steel, polished brass (lacquered) and electroplate (nickel and chrome).

Dealing first with vitreous enamel, this was selected for the larger items of equipment for several reasons, not the least being that the firm felt that, with such an important process as vitreous enamelling it was much better and much more economical to have it done outside by specialist firms than to attempt to set up a department for it. A wise decision as the equipment involved is quite considerable and the individual firm, when setting up a plant for the purpose, cannot, obviously, afford to tie up capital in plant of very large capacity and, moreover, cannot hope to have the staff, the

experience and the "know-how" of the specialist enameller to the trade.

We asked about the selection of finish colours and patterns used in the vitreous enamel finishes. Some very interesting information was forthcoming in this connection, and an aspect of the subject which does not often occur to the purchaser was raised. As is well known, certain types of vitreous enamel finish, particularly the flecked or speckled types are not easy to duplicate in large quantities as the size and disposition of the specks or flecks may vary from batch to batch.

Left, the Mastertherm overhead heater; below, the Newtherm, suspended type, underfired heater

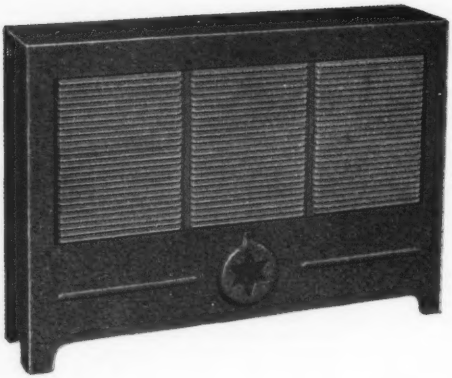
In the case of the single unit such as a domestic cooker or washboiler which is only installed in single individual positions, this is of no great consequence but, when the same finish is used on say a convector heater and perhaps a dozen are installed along each side of a public hall or similar situation, the variation can be very noticeable and quite enough to completely spoil the appearance of the installation. For this reason the colour patterns standardised for this type of equipment are those which are known to be consistent in repetitive batches.

The favourite colours for space-heating units are bronze, green, brown, mottled brown or cream. There is practically no demand for blue (a "cold" colour) or yellow, red and black. The two most popular combinations, we were told, are mottled brown and mottled cream. Fortunately these can be repeated with consistent results and vary very little from batch to batch.

Vitreous enamel, according to Radiant Heating, is the almost perfect finish for space-heating equipment. During construction many of the parts, finished in a previous operation have to be handled, moved, placed on benches and generally worked on. The ordinary stoved finish is easily scratched and damaged but the enamel stands the handling with little or no risk of damage.

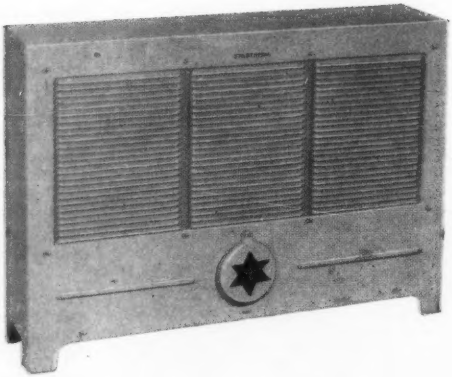
Due to the fairly considerable bulk, space-heating equipment often suffers damage in transit, during movement in showrooms and warehouse handling. Stoved synthetic or cellulose paint surfaces get bent, and buckled and the finish suffers. The vitreous enamel has an advantage here, it is either unaffected by minor scratching or it gets flaked and the part has to be changed in any case. There is little risk of surface damage remaining on the job when it gets to the customer; it is either quite all right or it is damaged and renewed.

Expansion and contraction due to the effects of heat and deterioration of the finish due to the sulphur or other components of the fumes from the heating unit are also factors which affect the life of a paint finish; again, the vitreous finish stands up to this. The life of a good item of space

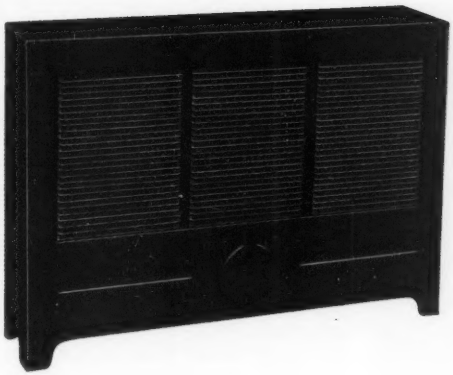


A range of Startherm gas-fired background heaters made of mild steel sheet and stoved

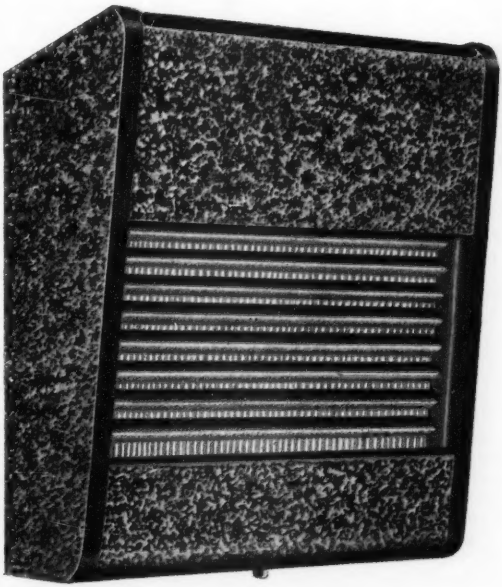
Outside is smooth and clean, all fittings are concealed and the choice of colours is: mottled brown, cream, apple green or olive green



Right: the Supertherm, low-pressure heater. Finished in mottled vitreous on cast iron with bright edge strips



These heaters are about 18 *in. by* 14 *in. by* 4 *in. and are provided with colour anodised louvres to ensure that the products of combustion do not discolour the casing.*



A Salamander using radiant heat, all parts subject to the heat are finished in acid-resisting vitreous enamel

heating equipment is in the region of 10-12 years and during this time the finish has to stand up to alternate heating, cooling, exposure to moisture, abrasion, dust and fumes. It has been the experience of the firm that only a first-quality acid-resisting vitreous enamel can stand up to this service.

The design is, of course, very important as the vitreous finish sets certain limitations in the way of panel thickness, area of strip, sharpness of bends and radii, and the need to eliminate sharp corners as much as possible. A glance at the examples illustrated here will show that this has been studied to a considerable degree. The moulded contours of the Floortherm, the bold solid castings of the Newtherm and the clean, smooth castings of the Supertherm bear witness to the care exercised in designing for vitreous finish.

For some of the smaller units such as the little Startherm floor heater illustrated on page 250, a stoved paint finish is used. The main reason for this is that the units are designed to sell in a very competitive market and are relatively inexpensive. As the cost of enamelling quality steel is high and the supply has not been easy for many years now, it was decided to use the less expensive, non-enamelling quality and use a sprayed and stoved finish.

These units are made from standard sheet steel material and finished in shades of mottled brown, green and cream. The louvres are made of colour anodised aluminium as it was found that this withstands the corrosive fumes and the action of the various types of household cleaners used by the housewife better than the painted steel or unfinished aluminium.

For spray-painted finishes, a complete spray plant is maintained at the works and this also carries out a considerable amount of work in the finishing of components and fittings used in the construction of the various models. A recent development is the adoption of a special type of silver coloured heat-resisting finish which is used for the metal parts subject to heat such as the actual burner holders, pipework in the vicinity of the radiant elements and similar parts. This material, we were told, withstands a temperature of up to 600° F. without breaking down and is found to be much better than the usual black found on most fittings.

Very little plating is required in the finish of space-heating equipment as the design is such as to eliminate trim and added fittings as much as possible. For this reason, the firm do not maintain a plating shop and any small amounts of plating required, usually confined to polished reflectors, bands and control fittings, are done outside by trade services.

The approach to packing and transport was a question in which we were

interested as it is of little use turning out a fine finish if the components are to be damaged or scratched in transit. Radiant Heating have tried out most of the well-known methods of packing and have found out the snags. If the product is packed completely in a box or packing case, the case is roughly handled, dropped off lorries and generally bashed around before delivery. The usual result is broken and damaged castings and scratched panels.

In the case of stoved or air-dried ordinary finishes, the use of certain types of packing materials can cause deterioration of the finish by chemical action—wood wool and certain paper pulp materials can do this—consequently the packing requires some thought.

Radiant Heating find that the best method is to use an open-work crate which shows quite clearly what is in the crate. The appliance is simply fastened in by strapping it to the base or backboard of the case and it is possible for the carrier to see the type of goods and, naturally, there is a greater tendency for them to take care.

Since adopting this method, they told us, the amount of "damage in transit" has been considerably reduced. The idea is applicable, of course, to many other products.

Metal Pretreatment and Reconditioning Plant in Belgium

ON 6th November, in the presence of official representatives of the three fighting Services, the Ministry of Supply, the Belgian Army and the Belgian Ministry of Defence, a large metal pretreatment and reconditioning plant was opened in a factory near Antwerp, Belgium. The premises were formerly the Mercedes-Benz plant where the Germans manufactured aero engines during the late war.

The work undertaken by this plant, in the factory of Ets. Beherman Demoen S.A. at Mortsel-Antwerp, will embrace the treatment of all tracked and wheeled vehicles for the Belgian Army and the N.A.T.O. forces, including the latest design tanks, guns and other equipment.

Basically, the plant comprises three immersion tanks (into which components are dipped) operated in the following order:—

(1) Degreasing and paint-stripping by Jenolite P.S.5 solution.
(2) Heavy scale removal by Jenolite H.S.R. solution.
(3) Rust removal, rustproofing and paint-bonding by Jenolite R.R.N. (the jenolizing process).

The size of Tank 1 is 29 ft. × 12 ft. × 9 ft., with a normal working capacity of 16,450 gallons of solution. Tanks 2 and 3 are each 30 ft. × 12 ft. × 10 ft., with working capacities of 15,250 gallons of solution. To this must be added a water-jacket capacity of 5,550 gallons, giving a total capacity of 20,800 gallons. The P.S.5 tank is steam heated through coils, and the other two by means of steam-heated water jackets.

Between Tanks 1 and 2 is a brick pit equipped for power rinsing, in which components are rinsed after degreasing and scale removal.

Components, both new and those requiring renovation and maintenance, are delivered from tank to tank by power-operated cranes capable of handling up to 25 tons weight.

This huge plant, valued at approximately £50,000, has been designed, erected and delivered by Jenolite Ltd.

National Apprenticeship Committee for the Vitreous Enamelling Industry

A SCHEME for apprentices in the vitreous enamelling industry has been agreed and has received the approval of the Ministry of Labour and National Service. It is administered by a committee representing the Vitreous Enamellers' Association and the Institute of Vitreous Enamellers, with an assessor from the Central Youth Employment Executive.

Apprentices are indentured and subject to supervision by the committee. A course of training is available which covers the industry in a comprehensive manner. The scheme will raise the standard of work among enamellers and should serve as a useful channel for attracting the right type of young man to the industry.

On completion of the apprenticeship, which is generally four years, the indenture is suitably endorsed by the committee. No premiums are payable by the apprentice and further education is encouraged.

The secretary to the committee is Mr. C. Hardeman Smith, 96 Hagley Road, Birmingham, 16, from whom further details may be obtained.

Tin Printing on the Grand Scale

Tate and Lyle Plant is Printing and Stoving Five Million Tins Per Month

TO convert about 14 tons of tinplate into 500,000, 1 lb. and 800,000, 2 lb. containers, print these sheets in four colours including a metallic gold and then varnish them requires something rather unusual in the way of a tin printing and stoving plant.

Such a plant is the tin printing and stoving plant at Tate and Lyle Ltd., at Plaistow Wharf, London, E.16. and, as the illustrations accompanying this article show so well, the plant is most impressive both in appearance and performance. Before passing to a description of the equipment and methods, a brief note on the design of the tin and the scheme of decoration is, perhaps, advisable.

The original design may still be seen on some of the earliest examples of syrup containers held by the company. Basically, that design is the same today as the one first prepared by an unknown artist. It undoubtedly enjoys a special place both because of its long service and no less because of its popularity, bearing its biblical quotation: "Out of the strong came forth sweetness."

The present design is, of course, a slightly modified version of the original, the popularity of which was stressed when the company was considering the introduction of a newly designed container. New samples were prepared and submitted to members of the public together with the traditional container: the result was an overwhelming vote in favour of the old one.

So it may be said that the present technical arrangements for operating the tinplate printing and stoving department were settled in advance by popular demand.

The four colours used in the printed design are white, gold, green and black; the varnishing coat is applied over wet black. The actual order of printing the different colours is determined in the first place to meet the requirements of the master printer; he has to consider the gold effect required—produced by printing gold on to a white or plain tinplate background—and the use of black, in addition to its function for lettering, as a liner for the important job of relieving and unobtrusively emphasising the various colour effects.

The sequence of colour printing has been arranged to give the best result to the finished work, whilst the general arrangement of the ovens in the colour sequence provides a smooth series of operations without wasted effort.

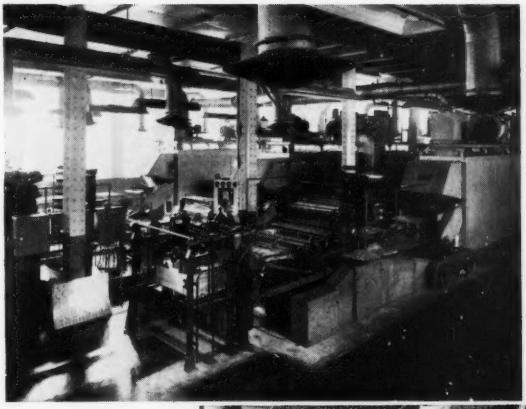
The visitor to Tate and Lyle's tinplate printing and stoving department will remark the roomy disposition of the plant, the excellent lighting afforded by both natural and artificial means and its strikingly clean appearance as first impressions.

The scheme for lighting includes, as a natural source, dado to ceiling windows extending the length of the room on either side, supplemented by fluorescent tubes situated well above the working space, whilst loss by absorption is reduced to the minimum by having the interior decoration, ovens and other equipment painted in aluminium colour.

Printing and Drying Equipment

The department is equipped with four gas-fired drying ovens. Each is served by its own lithographic printing machine and automatic feeder; three of the machines also have automatic unloaders and, in due course, all four will be similarly fitted.

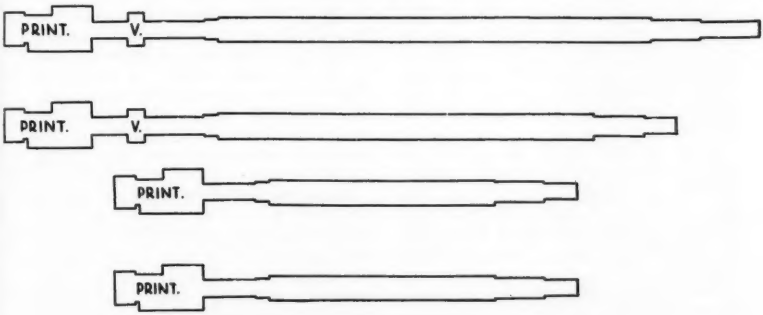
The tinplate sheets, when printed, are automatically fed to synchronised travelling ovens in which the gas-

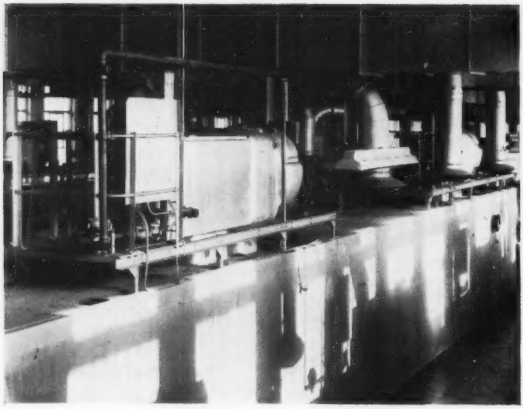


Automatic feeder for tin sheet printing machine and entry into drying ovens as seen from the machine end

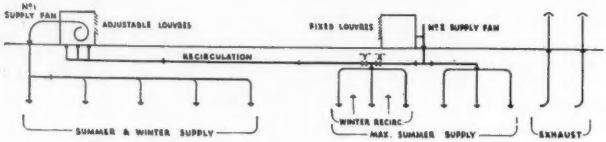
The considerable length of the oven line may be judged from this view down the department

Layout and comparative lengths of stoving ovens (the symbol V is the varnishing section)





Left: supply fans and extractor ducts on top of the ovens. Right: gas burners and control gear on oven top. Below: diagram of the seasonal control scheme for air heating and ventilation



burning equipment is fully provided with thermostatic controls, electronic type flame failure devices and purge timer and spark ignition.

Each of the ovens works to a predetermined colour and standard in drying and stoving. In this respect the department is unique because it was designed for the single purpose of printing, coating, and stoving tinplate sheets for pressing and cutting into containers for the well-known product, Lyle's Golden Syrup.

Oven lengths vary according to their specified tasks; the shorter two in number are 42 ft.; the two others are respectively 70 ft. and 80 ft. in length. These measurements represent heating sections only and are not over-all figures.

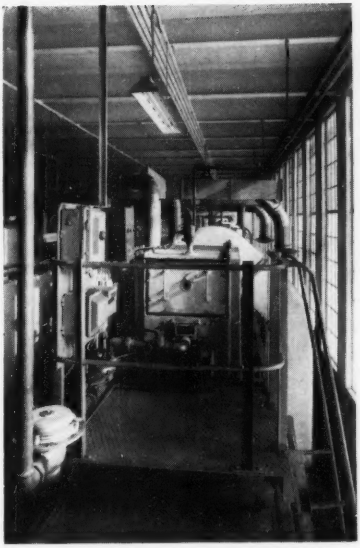
Three of the ovens, the two 42 ft. and the one of 80 ft. are used for the stoving of printed sheets only; the oven of 70 ft. length undertakes the stoving of sheets that have been both printed and varnished. This is a single operation.

The heating equipment of the ovens varies according to the length of the unit. Each oven of 42 ft. length has one heater and one circulating fan unit; the one of 70 ft. length carries two heaters and two circulating fan units whilst the equipment for the 80 ft. oven combines three heaters and three circulating fans.

Stoving is followed by cooling. The apparatus for cooling is situated in the section between the points when drying ceases and delivery for unloading commences.

For this purpose, there are four 35 in. two-stage fans with a capacity of 10,000 c. ft. per min. against 1·2 s.w.g. The fans are powered with $4\frac{1}{2}$ h.p. motors running at 930 r.p.m. The starter equipment includes thermal overload, single-phase preventor and pilot lights, all mounted on the steelwork of the oven at the cooling end.

Exhausting the products of cooling are four "Keith" 35 in. axial flow fans with a capacity of 12,500 c. ft. per min. against 0·5 t.w.g. Each fan is powered by a 3 h.p. motor. The starters complete with pilot lights, thermal overload and single-phase



preventor, are mounted at the cooling end of the oven.

The cooling equipment includes an air filter of the "Visco" self-cleaning type, with a capacity of 48,000 c. ft. per min. The pump drive motor is 4 h.p. and the strainer motor is of ¼ h.p. The daily consumption of tinplate in the department is in the region of 14 tons weight. This daily weight of sheets is converted after the four printing and stoving operations into a weekly total of 500,000 1 lb. containers and 800,000 2 lb. containers, or 900 tons of Lyle's Golden Syrup in small containers per week. These figures represent the normal production capacity of the plant.

Gas consumption for one week's working may be stated as approximately 216,000 c. ft.

The following figures show the rate of travel for each oven with its respective colour printing.

Feet.	*Minutes.*	*Colour*
42	12	Gold
42	12	Green
70	15	Black/Varnish
80	17	White

Air Cooling and Conditioning

The printing and drying of tinplate are processes which result in certain fumes finding their way into the atmosphere of the department. To these may be added the heating due to radiation from the oven walls, a factor of special importance in the warmer seasons.

In the tin printing department at Messrs. Tate and Lyle's, removal of the solvent fumes from the printing inks is effected by exhaust fans situated at the front ends of the ovens. The fumes are drawn away from the working space and flow through ducting to the outside of the building.

To maintain good working conditions in the department, a ventilating and air change plant has been added to the stoving installation. This arrangement provides for both heating and cooling according to seasonal requirements, and for air changing throughout the year.

A three-stage operation is involved providing for three phases:
(1) winter conditions; (2) normal summer conditions;; (3) maximum summer conditions.

An interesting feature of the application of additional heating to the department is the maintenance, during the winter, of a suitable temperature at nights and week-ends, that is during the off-working periods. This is particularly useful in preventing condensation of moisture on the tinplate stocks.

In the winter season, in accordance with the external temperature, the number of air changes is reduced to a minimum. Great care is taken to obtain plenum conditions in the building. For this purpose, all exhaust fans are fitted with volume control dampers.

In the summer, as the air temperature increases, so is the number of fresh air changes stepped up to reach full potential. When the maximum summer conditions are reached, about four times as much fresh air is supplied to the department as compared with the winter months.

For the supply of fresh air, two filter houses are sited on the roof of the building; one of these is equipped with fixed louvres and functions only in maximum summer conditions. The other has adjustable louvres providing

for operation control and this is employed all the year round. Filter house No. 2, with fixed louvres, acts as a booster when exceptional conditions demand additional cooling in the department.

The filter houses enclose "Visco" rotating self cleaning air filters, having a capacity of 34,000 c. ft. per min. They are equipped with 3 h.p. pump drive motors operated by push button starters with thermal overload device. The strainer motor is of ½ h.p. with push button starter and thermal overload.

The supply fans in the filter houses are "Keith" No. 54, cased centrifugal fans, with vee-belt drives and a right hand top horizontal discharge; they handle a volume of 34,000 c. ft. per min. Power is from 20 h.p. "Crompton" T. E. Motors fitted with "Auto" Star Delta Starters with interlocking isolators and ammeters arranged for remote control form the ventilation panel.

Air distribution is divided into two phases to correspond with the appropriate filter houses as follows: serving the fixed louvre house are eighteen 14 in. "Airmaster" diffusers—type A. with annular rings.

Thus, in the maximum summer conditions, forty-two air diffusers function as air cooling and refreshing plant.

The adjustable louvres provided in one filter house give an operational variation for both summer and winter conditions.

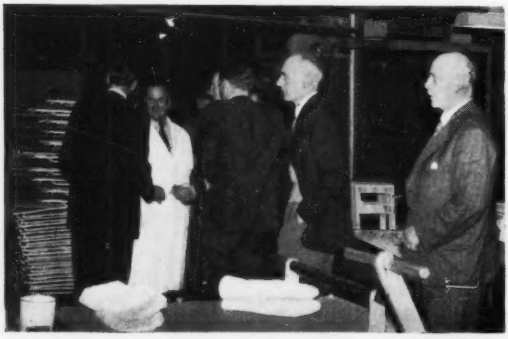
The ovens, cooling and air changing plant were designed and constructed by Controlled Heat & Air Ltd., Cornwall Road, Smethwick, Birmingham, for Tate & Lyle Ltd., London, E.16. Town's gas is supplied by the North Thames Gas Board.

INSTITUTE OF VITREOUS ENAMELLERS

MEMBERS of the Institute of Vitreous Enamellers recently paid a visit to the main foundry and works of the Gas Division of Thomas De La Rue & Co. Ltd., at Warwick. The visitors arrived at the works at midday and were welcomed at a lunch in the Woolpack Hotel by Mr. E. G. Brooks, general works and technical manager, who introduced to the guests the various members of De La Rue staff who were to be their guides for the tour of the factory. Mr R. J. Rogers spoke on behalf of the institute members, thanking the company, through Mr. Brooks, for the invitation to visit the factory.

Arriving at the works after lunch, the visitors split into small groups, each with a De La Rue guide, and visited the foundry, fettling shop, machine shop, pattern shop, boiler assembly department and the cooker assembly shop, where they saw a representative display of the company's products and were invited to take part in a "quiz" by indicating their personal preferences for six cookers which had been prepared in different finishes.

To complete the tour all the groups converged on the enamelling shop, in which the visitors displayed a particular interest in the enamelling of cast-iron and sheet metal components.



One of the Institute members is introduced to Mr. Walter Godfrey, foreman of the enamelling shop

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Chemical Treatment of Ships' Hulls

IN an editorial article a few months ago we discussed the experimental adoption of a proprietary rust-proofing treatment for the hulls of seagoing vessels. Since the publication of this article we have had the opportunity of discussing this problem with the technicians of the Walterisation Co. Ltd., of Purley Way, Croydon, who informed us that they had been carrying out extensive trials on the same lines since early in 1951.

In view of the obvious interest of the work to the readers of INDUSTRIAL FINISHING, we have obtained the agreement of Walterisation Ltd. and the owners of the vessels concerned, Cayzer, Irvine and Co. Ltd., to the publication of a report on the progress and results to date.

The first ship to be treated was the s.s. "Clan Sutherland" a photograph of which appears in this article, this ship was followed by the m.v. "Clan Macintosh," m.v. "Clan Macinnes" and the m.t. "Scottish Eagle" owned by the Scottish Tanker Co. Ltd.

These ships had their underwater surfaces treated up to 1 ft. above the light water line during construction. The recommended treatment being:

After wire brushing, Walterisation Foscote R.S. was applied, following the standard instructions of the manufacturer. This was followed by two coats of "Impervo" Underwater Composition. On completion of fitting out the vessel is docked and one coat of Graig's Anti-corrosive and one coat of Graig's Tropical or Super Tropical Anti-fouling Composition is applied.

This scheme was first tested out on the s.s. "Clan Sutherland" and has been subsequently specified for all new ships constructed to the order of Cayzer, Irvine and Co. Ltd. The "Clan Sutherland" has now been in service since 1951 as she commenced her first voyage in March of that year. She has since completed seven voyages and has been in dry dock four times when advantage has been taken of the opportunity to inspect her underwater surfaces.

On each occasion the owners report that the underwater surfaces are in excellent condition and absolutely no sign of rust has been found, nor is any trace of corrosion evident except in the region of the stern post and rudder

where galvanic action is undoubtedly responsible for the slight scale and pitting found.

In the case of the other ships the owners state that it is yet a little early to give detailed reports as they went into commission rather later; preliminary reports, however, are much in line with those on the "Clan Sutherland," and the type of comment which often appeared on the dry-docking reports on earlier, untreated ships to the effect that large areas of the bottom were bare of paint and had patches of loose scale and blisters of rust has not occurred on any of the treated ships. It must be emphasised, of course, that the treatment is only applicable to new construction in the shipyard. The results, however, certainly appear to bear out the theory that a considerable amount of labour and expense can be saved by the adoption of a satisfactory system of rust-proofing and paint keying in marine construction.

Another point that must be made quite clear is that the Foscote system used in these experimental vessels is the normal industrial process as used for the protection and paint film keying of rusted steelwork. It is not a process for use on clean, bright steel; other processes are available for such use. The fact that it is designed for use on *rusted* steel makes it particularly suitable for marine work as the steel plates used in the shipyard are invariably rusty, this is the natural result of them being left out in the open during building.

Prior to the adoption of the process for the Clan Line ships, a series of independent tests were carried out in 1950, in which four steel plates, prepared as described in the following table, were suspended in a salt spray

I	*II*	*Plate A*	*Plate B*	*Plate C*	*Plate D*
4	80	Very slight rusting at edges at of plate only, no corrosion.	No rust or corrosion.	No rust or corrosion.	No rust or corrosion.
8	160	Rust spreading and corrosion commencing.	Slight rusting, no corrosion.	As above.	As above.
14	280	Badly rusted and marked corrosion apparent.	Rust spreading and corrosion commencing.	Slight rusting commencing, no corrosion.	As above.
18	360	Complete breakdown of paint film and very heavy corrosion.	Rust general, corrosion spreading.	Rust spreading, corrosion spreading.	As above.
25	500	——	Complete breakdown of paint film and very heavy corrosion.	Rust, general slight over-all corrosion	As above.
30	600	——	——	As above.	As above.
40	800	——	——	Rust general, corrosion spreading.	As above.

Key to columns above:

I. Time in days in salt water spray apparatus.

II. Approximate equivalent in days' average weather conditions.

Plate A. All rust removed and one coat of genuine red lead applied.

Plate B. All rust removed and two coats of genuine red lead applied.

Plate C. Lightly wire brushed, coated with R.S. solution followed by one coat of genuine red lead.

Plate D. Lightly wire brushed, coated with R.S. solution followed by two coats of genuine red lead.

apparatus for forty days. During this time they were subjected to the vapourised mist of sea water for a period of 10 min. every hour. This accelerated corrosion test is, of course, equivalent to about twenty times the normal exposure. The results show that a panel treated in the manner described for the marine work and given two coats of red lead paint is completely resistant to corrosion for a period of more than two years of average weather conditions.

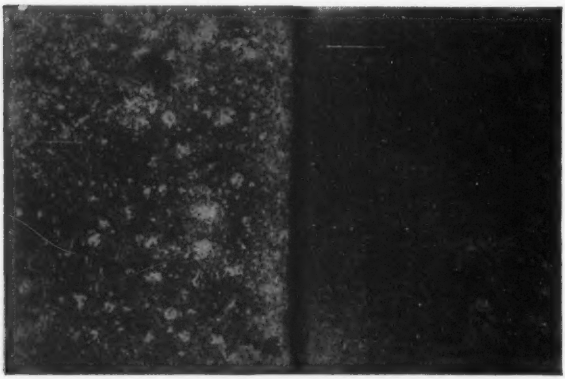

Fig. 1

Fig. 1 *shows rusty steel of the type used in shipyards before treatment with Foscote "R.S."*

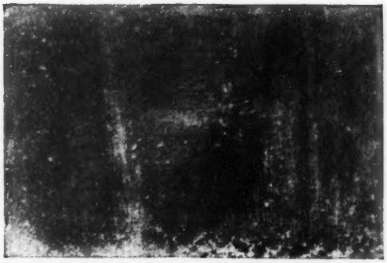

Fig. 2

Fig. 2 *shows the treated plate after* 24 *hours' immersion in sea water, it is quite passive and free from corrosion*

Fig. 3

Fig. 3 *shows clean, bright steel, untreated and subjected to the same water immersion test for the same period*

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Tin Printing, varnishing and lacquering; industrial ovens of the continuous and batch types; the brochure describes a number of such ovens, with accompanying illustrations and explanatory text. Operational features are included. Stordy Engineering Ltd., Cumbria House, 85 Goldthorn Hill, Wolverhampton. (163)

Barrel Plating, specification details of a new plating barrel offering adjustable angle, shock-proof tilting, rotation during emptying, and built-in motor unit drive. The barrel is suitable for most metals other than chromium. W. Canning and Co. Ltd., Birmingham 18. (164)

Drum Heater, operating at temperatures up to 450° F., for use with a wide variety of materials, to assist removal from drum by pouring, pumping or dipping. The heater is thermostatically controlled and is designed to fit the standard 45-gallon drum but adaptable for smaller drums. The leaflet offers details of construction and use. The Stabilag Co. Ltd., 1 Broad Street Buildings, Liverpool Street, London, E.C.2. (165)

Photo-copying Printing Machine; the folder illustrates the machine and accessories for reproduction from loose sheets or bound books. In operation no dark room is necessary and the use of the equipment enters into normal office routine. Ilford Ltd., 104 High Holborn, London, W.C. (166)

Roller Painting, a survey of its capacities for interior and exterior work with a consideration of methods according to materials being used—a brochure. R. Gay & Co., Westmorland House, 127-131 Regent Street, London, W.1. (167)

Spray Gun, for heavy duty production; construction details are given with information on special features and recommended nozzle settings for the unit. B.E.N. Patents Ltd., High Wycombe, Bucks. (168)

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READER SERVICE

Embossed Aluminium, an industrial finish for rolled products; typical applications of embossed sheets are listed and the advantages of the process are explained. The tri-folder carries illustrations showing effects produced and a size and thickness chart is included. The British Aluminium Co. Ltd., Norfolk House, St. James's Square, London, S.W.1. (169)

Car Washing Plant, hydraulic, portable and electric motor driven alternatively using a four-stroke petrol engine according to capacity required; standard equipment includes high-pressure hose and adjustable washing guns; delivery pressure is from 300 lb. to 350 lb. p.s.i. The information is in leaflet form, with illustrations. Williams and James (Engineers) Ltd., Gloucester. (170)

Agricultural Machinery Finishes, techniques and colour considerations; the brochure also gives details of some cleaning solutions and methods employed, paint applications and drying. Robt. Ingham, Clark and Co., Westmorland House, 127-131 Regent Street, London, W.1. (171)

Air Compressor, portable, fitted with pressure gauge and safety valve, operated by ½ h.p. motor. Illustrated leaflet. Dawson, McDonald and Dawson, Compton Works, Ashbourne, Derbyshire. (172)

Metal and Plastic Coatings, flame-sprayed in powder form at high velocity, including zinc, aluminium, polythene and other metallic and plastic substances used as coatings. Schori Metallising Process Ltd., Brent Crescent, North Circular Road, London, N.W.10. (173)

Bituminous Waterproofing, semi-mastic, applicable also to rustproofing, linings, settings, resistance to acid and salt water attacks. The leaflet describes applications, covering capacities and methods. Andrew Maxwell, Maxwell House, St. Paul's Square, Liverpool 3. (174)

Laboratory Glassware, the Quickfit range, a general catalogue with diagrams, descriptions and sizes of the various pieces of equipment. Quickfit and Quartz Ltd., Quickfit Works, Heart of Stone, Staffs. (175)

Welding Fluxes, non-corrosive, in four grades, for use with aluminium and aluminium alloys; each grade is detailed for application with working instructions to suit. Unifluxes Ltd., Davis Road, Surbiton, Surrey. (176)

Cathode Suspenders, a description, with illustrations, of some of the many suspenders available, insulated against loss of electric power. W. Canning and Co. Ltd., Birmingham 18. (177)

(*Continued on page 265.*)

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Boiler Combustion Equipment, automatic, thermostatic, to give greater efficiency in the consumption of solid boiler fuel. The unit may be fitted to any make of boiler; operation is by low pressure air supplied by an electrically driven blower. Thermofire Engineering Co. Ltd., Nelson Works, Stroud. (178)

Phosphate Coating, designed for operation in automatic and semi-automatic conveyorised plants; the publication gives operating instructions including pretreatment, make-up, processing time and after-treatment. A table shows salt spray resistance according to finish used. The Walterisation Co. Ltd., Croydon, Surrey. (179)

Polythene Application, a patented oven method; descriptive brochure with illustrations. Perfectairs Ltd., 314-314a Balham High Road, London, S.W.17. (180)

Spray Gun Technique, a motion study analysis for the user to enable the best quality finish to be obtained at minimum cost. The booklet, in addition to its textual matter, shows, by diagram, the right way and wrong way to treat most types of work. The Aerograph Co. Ltd., Lower Sydenham, London, S.E.26. (181)

Oil Firing, a burner range offering manual control, semi-automatic and automatic controls with electric ignition, designed for continuous fuel supply from tank to burner: descriptive folder. Nu-Way Heating Plants Ltd., Droitwich. (182)

Circulating Pump, for use with hot water heating systems, produced in a range of sizes suitable for 2 ft.-20 ft. friction heads and static heads up to 70 ft., requiring minimum attention. Thermofire Engineering Co. Ltd., Nelson Works, Stroud, Glos. (183)

Ceramic Decorations, metallic and colour applications; the booklet fully describes processes employed for both glass and pottery articles, both manual and mechanical. Illustrated. E. A. Kuffall, Park Avenue, Twyford, London, N.W.10. (184)

Coloured Bituminous Coatings, brush or spray application, offering distinctive treatments for metals, wood, asbestos, asphalt, canvas, etc., suitable for structures and installations. Explanatory and illustrated brochure details colours and coatings available. Andrew Maxwell, Maxwell House, St. Paul's Square, Liverpool 3. (185)

Wood Finishing, a special brochure on the use of infra-red equipment for the purpose describes the methods used and gives illustrations of typical plants which have been installed. The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2. (186)

Electric Cable Couplings and Plugs, a recent catalogue of components covering all purposes in which each item is illustrated and power values noted. Switches, fuse boards, and similar equipments are also covered. Simmonds and Stokes (Niphan) Ltd., Victoria House, Southampton Row, London, W.C.1. (187)

Airless Water Spray Gun, operated from water mains or from a condenser on steam line, particularly suitable for dry-cleaning processes; a specification with diagrammatic illustrations. Dawson, McDonald and Dawson, Compton Works, Ashbourne, Derbyshire. (188)

Boiler Feed Control, a fully automatic electrically driven pump, suitable for medium and small steam boilers with manual or mechanical firing, fuelled with gas, oil or solid fuels. The literature is comprehensive, including a typical layout with a fully automatic boiler feed operation. J.L.C. Engineering Co. Ltd., Oxgate Farm Works, Coles Green Road, London, N.W.2. (189)

Paint Film Protection, on aluminium and aluminium alloy surfaces, a chemical oxidation treatment; various methods are compared and the present one described with work progress instructions. The Walterisation Co. Ltd., Purley Way, Croydon, Surrey. (190)

Electric Heating Equipment, jacketed type and gas-purged, specially designed for laboratory and industrial uses, with emphasis on safety considerations. The Stabilag Co. Ltd., 1 Broad Street Buildings, Liverpool Street, London, E.C.2. (191)

Electric Sanitary Incinerator, a leaflet describes this useful device for the disposal of used surgical dressings, sanitary wear, etc., which present such a problem in the modern factory. The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2. (192)

Infra-red Heating by sheathed wire elements. A leaflet describing the system, construction, use and properties of the equipment is available. There are two elements to each reflector, which may be used together or singly, according to connection and switching arrangements. The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2. (193)

To ensure maximum benefit from this feature, manufacturers are asked to send a specimen of any new literature they think suitable for inclusion.

Filling Leads to Fine Finishes

by **J. H. OUSBEY**

A FINE finish on an article implies that the surface is smooth irrespective of the texture of the finish, that is to say, even for a semi-gloss or flat finish it is necessary to ensure that the metal surface does not show any defects.

When it is impossible during manufacture for the metal to be either kept smooth, flat and free from holes or to be fettled after manufacture, then resort must be made to filling during the painting processes.

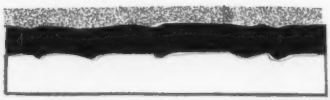
Many years ago when the materials available for the construction of such items as carriages, high-class cabinets and the like were of a very imperfect nature, it was always assumed that filling would be necessary and so such work was part of the painter's job and his knowledge of the procedure was complete.

So much was this so that in France there used to be "fillers to the trade" in the same way as there are now in the decorating trades "grainers to the trade."

These people used filling knives and other tools and their trade technique was excellent inasmuch as when they had finished, little rubbing was necessary in order to complete the levelling process.

The advent of pressed steel construction especially in the motor car industry did away with a lot of the heavy filling associated with coachpainting and when the cellulose lacquers were in full use on car bodywork the filling was replaced with "surfacing" which implied the light filling of the "grain" of the metal and stopping of the slight dents occasioned during the shaping of the parts on the presses. Accordingly, the art of filling, except in the coachpainters jobbing shops, fell into disuse and especially was this so with the art of knife filling.

Diagram showing that even though coats of filler reproduce the surface defects they are in fact filled in before the final coat



Nowadays the fact that good finishes are demanded on items which were formerly "painted" has led to a revival of the demand for smooth, level finishes and this at a time when the arts of filling have to some extent become part of the alleged decline in craftsmanship.

Probably the best example of this new demand is in the machinery world where goods which were once finished in a rough coat of lead colour now appear resplendent in pastel shades and with a finish which if not comparable to motor car work is at least quite acceptable.

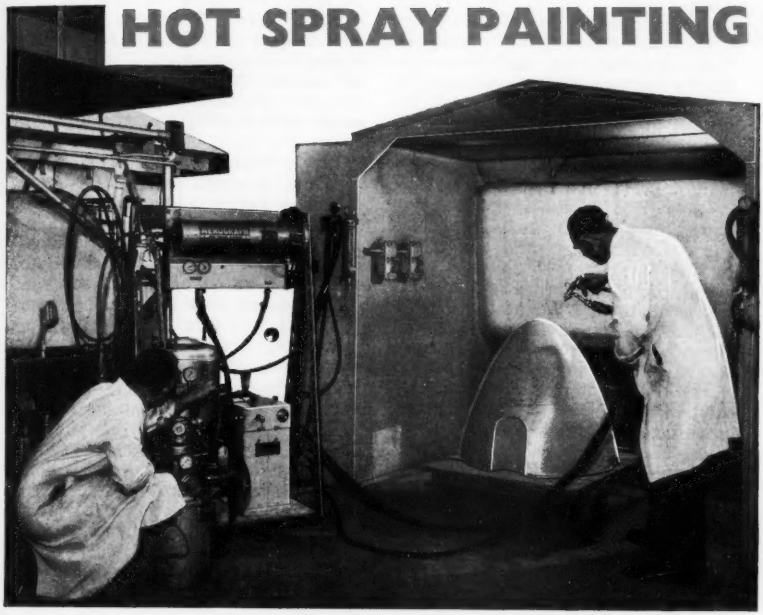
It appears that this demand will go on and with the increasing foreign competition become a permanent feature in some trades which build large or small machines.

Unfortunately the fact that technical advances have made machinery more complicated, does not ease the situation for those called upon to produce the good finishes. Castings in any metal are not normally the easiest bases on which to produce good finishes and when the carcases of machines are complicated, the foundries find it difficult to produce castings free from blow holes.

As it is obvious that the better the start the better the finish, it would seem that the good finish starts with the casting being as perfect as can be, the foundries, however, blame the design department when the castings are imperfect from the painters point of view. So it seems that good finishes must really start in the drawing office.

If close co-operation can exist between those who design the component parts of an article and those

HOT SPRAY PAINTING



How to Control the Finish—from the Start

The great advantages of Hot Spray painting are only just being realised. For many industrial purposes the use of the pre-heating process will give an excellent finish much more quickly, with less labour and with an appreciable saving in cost.

For those who want to know more about it, the Demonstration Centre offers full facilities for practical demonstrations on customers' own products. What is more, we will gladly train paint-shop operatives at specially arranged short intensive courses—at no cost or obligation to the customer.

This is *your* opportunity to gain impartial and unbiased advice on the process that is revolutionising many industrial finishing procedures. If the process is suitable for *your* product, we will show you how best to use it. If it is *not* suitable we will save you expensive "trial and error".

The photograph shows a corner of the Demonstration Centre with operators hot-spraying synthetic enamels at the water-washed spray-booth. Three types of paint heaters are shown in the illustration. Take advantage of this "know-how" and let us help you to *control* your finish.

Just write to—

Demonstration Centre

JOHN HALL

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who must ultimately produce the selling finish, then finishing will be very much easier and cheaper.

However, finishers must deal with things as they are and meet the demand of the sales department for the finishes which will help sell the articles in competition with others in the same field.

The mere fact that there is competition means that costs must be kept down and to suggest methods which appear to introduce more operations and materials may mean difficulties for the finisher. The difficulties can usually be overcome when it is pointed out that doing the job in the right fashion merely means spending the money at the correct stage of the work instead of later in rectifying rejected work. For example, extra coats of paint will improve a finish (when used in conjunction with local stopping up of defects which appear noticeable in the finish) but the finishing paint is more expensive than the filler and the time needed for extra coats for filling purposes is no more than the time needed for respraying after rejection. But this time is spent at the right end of the procedure.

Let us consider a process which will lead to a good finish at reasonable cost and at the same time not add unduly to the time in terms of days needed for the finishing work.

When speed is essential thoughts turn to the rate of paint drying but this is by no means the all important factor in finishing and the writer has turned out show standard work in air drying synthetic finishes in exactly the same time as is needed for other finishes which are more speedy such as cellulose. The process which the writer favours for many reasons is the air-drying synthetic finish where the type or structural features of the work make stoving impossible.

Synthetic finishes are not so brittle as cellulose lacquers, and a multi coat system using stopper and filler must, of necessity, be rather thick and the whole finish thus liable to damage if knocked. The damage is not so bad when the finish is not brittle.

Assuming an ordinary iron casting to be finished to a good standard. The first thing is to see that the fettling is as good as possible with special attention to small projections as, whilst defects in the form of indentations can be stopped up, no one can stop up lumps. The primer should be a red oxide material and if this has already been applied and the casting left outside for some time, as is often the case, then this first primer must be taken off as it will have little adhesive value.

The writer prefers a semi-glossy primer as this will readily reveal the defects which need attention. Where the time and price permit a de-oxidising or passivating treatment is advisable though the paint adhesion will be quite good on a rough surface of a normal casting provided that all grease and oil is removed as it would be, of course, during fettling or sand blasting.

When the primer is hard dry the stopping is done. Some prefer to stop up on the filler but the writer prefers to get the stopper on under the filler. The reason for this is that as filler faithfully reproduces the defects as each coat succeeds the other it is possible that time will be wasted stopping up defects which have really been satisfied by the filler. Reference to the diagram on page 266 will show why this is so. Conversely the stopping up of the defects prior to the filler will save perhaps a coat of this paint as then only minor defects will need filling.

Whilst the purpose of oil based heavy filler is to fill the roughness and defects it must also serve to level to a plane surface where the metal is not only rough but "wavy" also.

After the stopping, the application of filler paint may be either by brush or spray and the method used is one of preference and circumstance as the organisation of the finishing shop may better lend itself to brush application of filler than spray application. For example, the men employed on rubbing down and flatting may easily fill in waiting time by coating the items needing filler by brush, whereas the sprayers may have to treat this as a special job, especially where the spray booth facilities are limited or fully occupied with finishing work. In fact, where the amount of work is not too great, or where the items needing filler treatment are only part of the job, the two or three coats of filler per day can usually be worked in as

the first and last job of the day with the extra coat applied just before the luncheon break.

With work which necessitates filler being used all the time then, of course, spray application is the best as the filler can be used with equipment kept for this alone—a pressure fed system is the best here and preferably a container with an air motor operated agitator to ensure that the filler does not settle as heavy bodied fillers containing slate powder, mica, etc., are liable to do when left. Spray guns used for filler application need a different nozzle set-up than for finishing paints and most spray equipment manufacturers supply equipment for this work.

Where the deep defects are satisfied with the stopper knife, the number of filler coats will vary with the amount of levelling needed to the surface, anything from two to six coats being quite normal. It is usual when filler is brush applied on to large areas to reverse the laying off direction, that is each successive coat is laid off in the opposite direction to the last. This evens up the filler and prevents the brush marks—inevitable with filler—from becoming deep and thus troublesome when rubbing down.

A guide coat is essential as the rubbing cannot be successful without. This is simply a wash coat of some contrasting colour, usually black, put on after the filler is dry and it stains the filler so that the rubbing progress can be effectively checked. When the filler is rubbed back to its applied colour then the levelling can be assumed to be reasonably complete.

The rubbing is done with the normal wet-or-dry abrasives of suitable grade, that is, of a keen enough cutting power to be rapid in action but not too rough. 240 and 180 will be quite coarse enough and the rubbing is completed with a worn paper so as to remove any scratches. The work, of course, is done wet as dry rubbing of filler is not pleasant even though the filler may have no lead content. If it has, the Factory Act relating to painting processes expressly forbids the dry rubbing of filler.

A cleaning up operation follows the washing off and drying and the object here is to remove filler from edges, bolt holes and any place where a fat edge of paint is not desirable. Small scrapers and pieces of rough abrasive are needed for this operation and care taken here will lead to a neat finish.

The finishing process can normally follow now especially, and as usually will be the case, where the finishing is to be done by spray application. The undercoat synthetic may be applied directly over the filler, some absorption will be noted but another coat can follow wet on wet when need be. The undercoat when dry may be lightly "scuffed" with worn paper (dry) to remove any roughness and the first coat of the finishing synthetic sprayed on.

This finishing coat must be left to harden after which the entire article may be flatted wet in order to provide a smooth surface for the reception of the final coat of finishing material.

At this point great care is needed if the finish is to be really good. The paint should be carefully strained through metal gauze and the spray equipment should be really clean. The work itself should be carefully "tacked-off" just before spraying and, if these things are watched, the resultant finish should be good if the work is left to dry in a clean place. For work which is not small enough to put in a protected place it is a good plan to construct some light frames covered with scrim or muslin which should afterwards be soaked in a glue size solution to tighten up. These screens can be fixed above the work to catch any falling dirt.

When the finish is dry and hard any masking can be removed taking care to cut around the edges to prevent lifting the finish at these points.

Synthetics can be lightly polished before the work is shipped, using a car type polish.

In terms of days a finish such as the one described would take six days to complete the work and the time would be made up as follows: *First day*. Clean, fettle, prime. *Second day*. Stop up and apply first coat(s) of filler. *Third day*. Complete filling operation. *Fourth day*. Rub filler clean up and if in warm conditions spray undercoat. *Fifth day*. spray finish coat and leave to harden. *Sixth day*. Flat and spray final coat of synthetic.

It may be possible, under very good shop conditions to prime and stop up

in one day in which case a day is saved. Similarly it may also be possible to apply undercoat and a top coat on the day the work is rubbed, depending, of course, on the shop conditions and the time needed in hours to do the rubbing.

The time in hours, of course, depends on the size and intricate design or otherwise of the workpiece.

A good "time in days" saving plan, where the work is large, is to get all hands available on the rubbing down as filler, when rubbed, needs some time to dry out as it is porous and holds water. The quicker the rubbing can be done, the more time will be left for the drying and the sooner the spraying can be started.

Compared with a cellulose process the foregoing is actually speedier as two operations are omitted. Cellulose lacquers would need a surfacer coat or two after the heavy filling and this would need flatting and the finish would need burnishing to get a glossy finish. There is also a saving in materials as there is little solvent wasted with synthetics.

International Council for Electrodeposition

AT the first meeting of the International Council for Electrodeposition, which was held recently at the headquarters of the Institute of Metal Finishing in London, Dr. Walter R. Meyer was warmly welcomed as the official delegate of the American Electroplaters' Society.

The Council considered the plans for the International Conference of 1954 which are now in an advanced stage of preparation. The date of the Conference has been fixed for Wednesday, 21st April, 1954, to Saturday, 24th April, and the venue will be London. It is anticipated that there will be whole-hearted participation by overseas delegates; in particular a strong contingent of scientific men and technicians of world-wide reputation from the United States is expected to attend. It is hoped, indeed, to organise a special session to discuss the latest American practice in electrodeposition.

On the eve of the International Conference a meeting will be held which is to be addressed by Dr. William Blum who has been invited by the Council of the Institute of Metal Finishing to give the Hothersall Memorial Lecture for 1953/54. This function will be under the auspices of the I.M.F. and not the International Council. Dr. W. Blum is well known for his numerous researches in the field of electrodeposition covering many years of active study of electrochemical processes and problems.

The International Council also considered such questions as mutual interchange of publications between countries and further concluded that such questions as universal standards of electroplating and universally agreed nomenclature and definitions of terms used in electrodeposition should be explored and would well repay future study.

Membership of the International Council is open to Technical Societies and Institutes throughout the world whose interests lie in the field of electrodeposition. They are invited to write in the first place to the Honorary Corresponding Secretary of the Council, Dr. S. Wernick, at the offices of the Institute of Metal Finishing, 32 Great Ormond Street, London, W.C.1, England.

Society of the Chemical Industry (Corrosion Group)

THE Corrosion Group of the Society of the Chemical Industry are holding a joint meeting with the Oil and Colour Chemists Association on 9th December next at Burlington House, Piccadilly, W.1. The subjects for discussion are: "Electrical Measurements in the Study of Paint Coatings on Metal," by D. M. Brasher, A. H. Kingsbury and F. Wormwell, and "Mechanism of Protection by Paints with Special Reference to the Action of Basic Pigments," by J. E. O. Mayne and D. van Rooyen.

The Corrosion Group, a subject division of the Society of Chemical Industry, is intended to deal specifically with the study of corrosion and its prevention, and to provide a medium for discussion among all concerned in these matters. An Education Panel has recently been instituted to promote the teaching of the subject at universities and technical colleges. The present syllabus represents the third session of the Group's activities.

The current issue of *Wiggin Nickel Alloys* contains articles on precision casting of the Nimonic alloys, uses of Monel in electric motors, fine bore tubing in nickel and high-nickel alloys, uses of Inconel in a submerged combustion device, exhaust valves in Nimonic 80 and fusion cutting of high-nickel alloys. Copies of this journal published by Henry Wiggin & Co. Ltd., are obtainable, free of charge, from Wiggin Street, Birmingham, 16.

RECENT DEVELOPMENTS

MATERIALS : PROCESSES : EQUIPMENT

ANTI-OXIDANT COATING

ACCORDING to a correspondent in Germany, a new coating material has recently been introduced which is claimed to allow metals to be stored, handled, or carried about without greasing or protective coating of any type. According to the information we have, metals treated by brush, dip or spray application of Pantarol keep their lustre and become smooth to the touch whilst dust and dirt can be washed off.

Humid air, steam and even weak acid vapours are claimed to have no effect on the coating; and the impregnation is imperceptible and durable, it will withstand 200°–250° F. and can be used for brass, steel, aluminium, bronze, copper, silver, etc. Pantarol is supplied by: Pantarol Werl, Joachim Richter, Karlsruhe, Baden, Postfach 70, Germany.

POLISHING COMPOUNDS

TWO new polishing compounds have been introduced by Kingsland Engineering Co. Ltd., 25/37 Hackney Road, London, E.2. These are called Witex and Greatex. The first, Witex, is a fast cutting composition in liquid form for use on automatic machines polishing chromium and stainless steels. Greatex is a similar composition but is slightly more greasy and is intended for application to felt bobs, etc.

NEW RUST INHIBITING LEAD PAINT

A NEW rust inhibiting lead paint has been introduced under the name "Calpinol" by Messrs. Foster, Blackett & James Ltd. A calcium plumbate paint, this is the result of considerable research and is claimed not only to provide protection against rust but, where a paint film has been damaged, it will prevent rust creep. It is claimed to have a smooth eggshell finish which will not crack or flake, and a spreading rate of 100 square yards per gallon. The material is extremely resistant to moisture and salt water, weathers evenly and uniformly and can be stored indefinitely; it can be used as a primer for new galvanised iron without the necessity of weathering or pre-treatment.

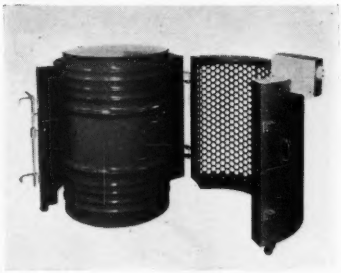
The paint is available in four colours, stone, venetian red, green and grey. It is supplied in five-gallon drums and in one-gallon and half-gallon tins.

DRUM HEATER

THE drum heating device shown in our illustration is an adaptation of the Stabilag infra-red heating jacket used in industry.

These heaters are "tailor-made" to fit any type of barrel or drum. The drum warmer is essentially an oven in portable form and when required to melt any product that has solidified, it might be placed round the drum over-night, so that the product is in liquid form for using the next morning. It is thermostatically controlled from 0–400° F. so that overheating beyond the predetermined temperature cannot take place. The average heating time for most materials is about 20° F. rise per hour but varying, of course, according to the absorption qualities of the drum contents.

The heater is designed for heavy industrial use and consists of two semi-circular segments each made up of three concentric members of 20 and 16 gauge steel rigidly joined together. The heating surface is placed between the inner and the middle member. The insulation, which consists of fibreglass 2 in. thick, is placed



between the middle and outer members.

The heater is provided with built-in heavy duty industrial type thermostats capable of handling the full electric load on the heater, and adjustable for any desired temperature range. A length of flexible electric conduit is also provided to enable the heater to be plugged in to any suitable socket.

Manufactured by Stabilag Co. Ltd., 1 Broad Street Buildings, Liverpool Street, London, E.C.2.

NEW PAINT SPRAY GUN

B.E.N. PATENTS LTD., have produced an entirely new spray gun in the model WH, illustrated here. This gun is designed for the big scale jobs in industry, for coverage at maximum speeds and for use with all types of materials. The spreader cap is a hot brass forging and the material nozzle is of stainless steel. Both the self-centring material needle and the variable spray control needle are of stainless steel and the latter enables the operator to vary the width of spray or change from round spray to fan spray without interrupting work. A descriptive leaflet is available from the makers, B.E.N. Patents Ltd., High Wycombe, Bucks.

NEW PAINT SPECIFICATIONS

ON behalf of the Ministry of Defence, the following specifications have been published by H.M. Stationery Office: DEF-1049-A. 1. Paint, Finishing, Ammunition, Stoving; 2. Paint, Priming, for use under Paint, Finishing, Ammunition, Stoving; 3. Paint, Finishing, Ammunition, Stoving, Lead Free; 4. Paint, Priming, for use under Paint, Finishing, Ammunition, Stoving, Lead Free. 27th July, 1953. Superseding DEF-1049 (21st Nov., 1952), price 1s. 6d. (by post 1s. 7½d.); and DEF-1050-A. 1. Paint, Finishing, Ammunition, Single Coat; 2. Paint, Finishing, Ammunition, Single Coat, Lead Free. 27th July, 1953. Superseding DEF-1050 (21st Nov., 1952), price 1s. 6d. (by post 1s. 7½d.).

DRAFT STANDARDS ON PAINTS

A NUMBER of draft standards have been circulated by the B.S.I. for study and comment. Among them are CR 5052, Ready Mixed Oil-based Undercoating and Finishing Paints (Exterior Quality); and CR 5053, Ready Mixed Oil-based Priming Paints. Copies of these draft standards may be obtained from the B.S.I. (free to subscribing members, 2s. to non-members).

NEW COLOUR-FLECKED FINISH

ACCORDING to a report from a correspondent in the U.S.A., a new type of colour-flecked finish is meeting with considerable success in many finishing operations. The new finish is a textured enamel type of material, is available in a series of colour combinations and is usable on a wide range of materials from metal to wood, plaster and plastic or papier mâché.

The new material, called Plextone, is being marketed by Maas and Waldstein Ltd., of 2117 McCarter Highway, Newark, New Jersey. It would appear to offer advantages in use on metal in being able to cover up weld and scratch marks. We are told that it also cheapens finishing costs on wood by needing less filling and priming than conventional materials. The principal characteristics claimed are as follows:—

Colour flecks are "through-the-film"—will not wear off.

Does not stain—crayon marks, ink,

stains, grease, dirt and other soil are removed easily and quickly without surface damage.

Stands abuse—resists wear, marring, chipping, cracking, abrasion.

Stands hard scrubbing with soap and water and scouring with abrasive cleansers.

Can be touched up without showing.

Air dries in approximately 30 minutes —normally hard enough to handle in two to three hours.

Flat or semi-gloss finish—or in combinations giving glossy highlights on flat background.

Easy to apply with ordinary spray equipment—no special spray techniques required; no spray dust.

Colour pattern and texture hide surface imperfections completely.

We understand that the new finish is available in about 20 standard pre-mixed colours and can be intermixed by the user to produce an assortment of colour combinations.

NEW PLATING BARREL

AN interesting addition to the Canning range of equipment is the Typhon electroplating barrel. This has been designed to put into the hands of industry at large a sound, reasonably priced barrel which will be reliable and efficient in use.

The Typhon is suitable for deposition of all the usual metals with the exception of chromium. Special features include: built-in motor drive, pneumatic damping, simplified control and the ability to rotate whilst emptying.

The welded steel tank is suitably lined for any solution and the barrel can be supplied with a wire mesh tray for holding the articles during emptying. A pneumatic damper ensures a smooth, shock-free return to the operating position after emptying. Article capacity is 2-3 gal., solution capacity 9-10 gal., speed 5 r.p.m. or other speed as desired, floor space required is 4 ft. 8 in. long × 3 ft. 4 in. wide × 5 ft. 5 in. high.

A special descriptive leaflet is available from the makers: W. Canning and Co. Ltd., Great Hampton Street, Birmingham, 18.

TEXTILE MATERIAL FROM GROUNDNUT FIBRES

WHILST not of direct interest to the finishing shop, many readers will have a "curiosity interest" in a new booklet produced by I.C.I. Ltd., describing their protein fibre "Ardil" which is a regenerated fibre available in the various deniers and staple lengths suitable for processing in blend with the natural and synthetic fibres on conventional textile equipment. "Ardil" fibre differs from the natural fibres in being constant in quality and price; it differs from the synthetic fibres in combining the warmth, softness and water-absorptive properties of wool with the smoothness of silk. Other properties of "Ardil" fibre of particular interest in woven and knitted fabrics for apparel are its resilience, non-inflammability and high degree of resistance to attack by moths and mildew.

More detailed information on the properties and uses of this new and versatile fibre are given in the booklet "Ardil" Protein Fibre and in a series of Technical Bulletins which cover the various stages in the textile processing of this fibre.

EMBOSSED ALUMINIUM SHEET

ONE of the biggest disadvantages in the use of sheet aluminium for plates, casings, panels, etc., is the fact that, owing to its comparative softness, it scratches easily and such scratches mar the finish and spoil the polished surface. One practical way in which this can be overcome is the adoption, wherever possible, of an embossed or patterned finish. In America a wide range of these embossed finishes has been available for some time and designers are using them as self-finish materials.

Aluminium sheet with an embossed finish is now available in this country and The British Aluminium Company is currently marketing a flat sheet material in two patterns—light stucco and heavy stucco—illustrations of which accompany this article. These two patterns are available for flat sheet and one is available in Rigidal corrugated sheet. The distinction between the two patterns is in the depth of the impression and both are available in commercial purity (99 per cent.) aluminium and in B.A. 60 alloy, in soft and half hard tempers, and in gauges from 24 s.w.g. to 18 or 16 s.w.g. These tempers are those of the sheet before embossing, the finished sheets being somewhat harder due to the work hardening effect of the embossing operation. The maximum sizes of sheet available are 8 ft. × 4 ft. and 8 ft. × 3 ft., depending on alloy, gauge and temper. Embossed Rigidal sheet is available in all three standard Rigidal profiles: 3 in. pitch, Mansard pattern and trough section.

The embossed surface has another advantage in that it does not reflect light to the same extent as the plain sheet and this feature can be taken advantage of in improving the appearance of panel work and similar structures, particularly if unpainted. Painting of aluminium is frequently specified, more to mask such defects than to give greater durability, but embossed aluminium can render this expense unnecessary for many applications. For corrugated and other roofing sheet, the embossed finish diffuses reflected light while retaining the full reflectivity and hence the heat insulating properties of aluminium.

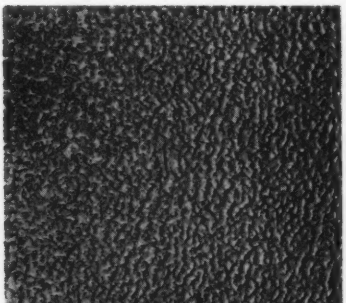
Supplier: The British Aluminium Co. Ltd., Norfolk House, St. James's Square, London, S.W.1.

NICKEL RESTRICTIONS REMOVED

All restrictions on the use of nickel have been removed by the Board of Trade and the Ministry of Supply with effect from 6th November.

The revoking Orders, the Nickel Prohibited Uses (Board of Trade) (Revocation) Order 1953, S.I. 1953 No. 1605 and the Nickel Prohibited Uses (Ministry of Supply) (Revocation) Order 1953, S.I. 1953 No. 1607, are on sale at H.M. Stationery Office.

A memorandum on chlorinated rubber paints by Messrs. Allweather Paints Ltd., contains notes on manufacture, properties and applications to corrosive environments.



Heavy stucco finish

Light stucco finish

MOTOR-CAR TRIM AND FINISH

A digest of developments at the Motor Show

"*YOU can have any colour you wish as long as it is black.*" Henry Ford is reputed to have used this phrase back in the early days of motoring. Personally, we doubt if he ever did say any such thing, but, whether he did or not, there is no doubt that the motor-car of his day was predominantly black; true, it was set off here and there by a bit of polished brasswork and an occasional line in gold or white, but, on the whole, it was Henry Ford's black car.

Judging by the recent Motor Show, however, the motor industry today is working on the principle that motoring should be a cheerful business even when only a means to an end. Colour played a vital part in this year's show and we feel that more colour was apparent than on any previous occasion. Leaving out, for the moment, the marine and caravan sections, the impressions in regard to finish fall into the following categories: Firstly, colour schemes, paintwork and general external finish of the cars themselves. Secondly, use of chromium plate, gilt metal and stainless steel in various connections. Thirdly, the revolution that has overtaken the motor industry in the matter of interior trim, upholstery colours and general interior finish. Fourthly, the wide range of materials, in the way of special covers, fabrics, metals, components, fittings and "gadgets" shown on the stands of the various exhibitors. Let us deal with the four points in that order.

External car finishes

Paint is not an expensive item in the production cost of a car but its quality is vitally important as appearance and durability have a considerable effect on the customers' sales resistance. Space obviously forbids a detailed description of the colour and finish of every make and model so we shall have to pick out a few of the highlights for particular consideration.

One outstanding trend is the return to two-tone colour schemes on cars in the middle and lower middle price range. A typical example is the new Hiilman "Californian," the colour schemes of which demand instant attention, the examples on the stand were finished in cream body with pippin red top, pastel green with bottle green top and quartz blue and cream. As these cars were fitted with white-wall tyres, chrome rimfinishers, and had contrasting interior trim, the effect can well be imagined.

Another example in the same line is the new Ford Zephyr Zodiac, the model we saw on the stand had a two-tone finish in grey and dark green with the wheels finished in the colour of the lower half of the body. White-wall tyres and rustless steel nave plates, a gold-plated nameplate, two-tone interior trim and really well-finished chrome external fittings added to the effect, giving a note of distinction to the car.

An unusual note was struck by the new Triumph sports car, an illustration

of which forms the heading to this article. Almost devoid of any chrome in front, except for the bumper bar, the body was finished in a pale shade of salmon pink, both eye-catching and attractive.

In the higher price ranges there were the usual examples of the specialist coachbuilders' work, mostly finished in cellulose and each a hand finished job. Colours of these special cars varied considerably, and often included two-tone and contrasting effects, for example, a Rolls Royce Silver Wraith was finished in Berkeley blue set off with a fine line; a Lagonda Tickford was in metallic Lugano blue, a Bentley in maroon and biege two-tone combination, a Daimler in dark green, a Bristol in silver cellulose, another Bentley in polychromatic silver-green and an Alvis in ice-blue and black two-tone; these are just a few examples of the more exotic specimens.

Curbing the tendency to linger and eulogise over the finish of these luxury vehicles, we reminded ourselves that, having regard to the total cost of these cars, the proportion available for finishing was quite high and a first-class job is really only to be expected. So we decided to turn our attention to the smaller, mass-produced cars which have been hitting the headlines during recent months in view of the low cost/high value for money demand which is prevalent today. We set off to find the Standard Eight, Ford and Austin exhibits.

First Standards new eight; this is a four door, four light, clean-lined four seater saloon body, rust proofed by Bonderizing, dust proofed and finished in stoved synthetic in green metallic blue and grey, the general standard of paint finish was very good, no orange peel, no thin patches, no thick edges, the frontal appearance is modern with little to take the eye from the smooth, painted surfaces. Three points we did not care for; the Standard emblem on the bonnet front looks cheap and tawdry, the red enamel is thin and weak, the painted insides of the doors and the locks showing inside look a bit "cold" and cheap; finally, the general lack of chrome trim on the exterior makes the car look a bit too "painted" in its appearance. Small points, perhaps, but definite impressions.

Then to the Austin stand, a new two-door model of the A30 was announced prior to the show and this was on the stand. This low price has been achieved without any cut in the specification or standard of finish of the car, and in fact, a number of important additions have been made. The two doors are wide enough to permit easy access to the rear seats when the front squabs are folded forward, and they allow for the fitting of much larger slide-down windows. The entire fascia and interior has been attractively redesigned to provide both a deep parcel shelf running the whole width of the car, the boot now has a lock and handle fitted and its opening is 4 in. larger all round. The general standard of paintwork was, again, very satisfactory.

The car has no air of austerity. Seats and door panels are upholstered in good quality leathercloth, the roof lined in washable fabric, and the floor carpeted. There is a wide choice of blending and contrasting colour schemes for paintwork and trim.

The Ford exhibit included the new Anglia and Prefect models, also the Popular which was only introduced a few days before the show. The Anglia and Prefect are available in a wide range of colours and body trim combinations and the models on the stand were in blue with blue interior, and fawn with red interior. The standard of paint finish on Fords is proverbially good. The bodies are, of course, made at Briggs Motor Bodies Ltd., who have long held a reputation for turning out a good paint job, the current models still maintain the tradition.

The Popular, a modified version of the old type Ford Anglia, is a little disappointing judged by the usual standard. Its painted nave plates on the wheels, aluminium bumper bar, small headlamps, single wiper blade suspended from the top of the body and general lack of chrome on the exterior give it a distinctly "austerity" look. Still, it is the cheapest car in the country today so we can forgive it a few appearance faults; inside, nothing has been sacrificed except the fascia. The old type plastic dash used in the Anglia has been replaced by a metal panel but, otherwise the interior is even better finished than its predecessor.

There was a wide range of American and Continental cars on show and we took the opportunity to examine and compare finishes. After much critical study and comparison of a number of American cars, we came to the conclusion that, price for price and each in its own range, we do a slightly better job of painting than the other fellow. There is one Continental car, however, to which we must give full marks as a really superb body finish, the Spanish Pegaso, but as its price is well up in the thousands, it ought to be good!

Plated components

Since the last Motor Show there have been several relaxations in the restrictions on the use of nickel and these have resulted in a rather wider use of plating than was possible before. In general, although the plate is undoubtedly better, there is little visual evidence of this, time alone will tell how much better it is. One or two cars in the higher price groups have started to use stainless steel for certain exterior trim. Another trend is the return to chromium windscreen and window surrounds, these had practically died out last year, but are now back on several models, many in the popular range. Rimfinishers are also beginning to be used on many quite reasonably even-priced cars instead of only on expensive cars as hitherto.

The use of gold or other "special" plates is not very prevalent in this country but it is quite often used on Continental and American models. A notable exception is the Ford which uses it on the new Zephyr Zodiac in the form of a nameplate.

The lifting of the ban on the use of nickel, and the consequent improvement in the facilities for plating have had their effect on the accessory trade; in the Gallery, among the stands of the various component and accessory firms there was ample evidence of this. Many extras and fittings which were in painted finish a year ago had returned to the familiar chrome. On the whole the quality of the plated finishes looked good, but, with chrome particularly, one can never tell until the part has been in service a few months.

We noticed with interest that the Zinc Alloy Rustproofing Co. had a stand on the ground floor and were showing their Sherardizing process. Examples of the various components rustproofed by this method included window channels, bonnet rods, panel pins, spanners, nuts and bolts, etc.

Interior trim

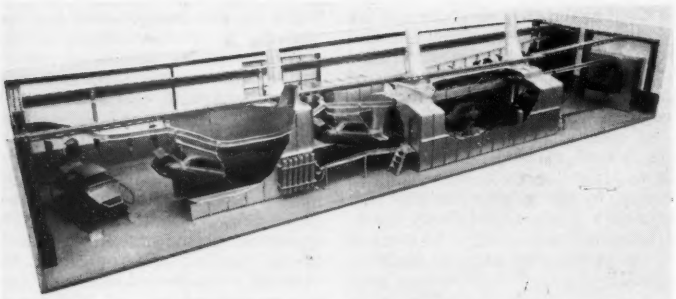
There has been quite a revolution in interior trim for motor-cars during the last few years, the advent of PVC and other plastic based materials has opened up a wide range of hard wearing, attractive coloured upholstery and seating fabrics and leathercloths. The makers have been quick to take advantage of the new materials and the result has been that even quite low-priced cars now have a choice of several different interior trim combinations.

A typical example is the use of Tygan woven monofilament fabric. The new Standard Eight is upholstered complete in it, and the new Humber Hawk Mark V uses it with a felt trimming. The material is very adaptable, there are twill weaves and herringbone weaves, plaids in bright colours and small quiet checks. Stripes and plain shades also play their part in the interior decoration of cars. With the new accent on low-priced cars from which certain refinements have been eliminated, this is an important point.

"We have specified a Tygan trim," an official of the Standard Motor Co. said when the new Standard Eight was launched a few weeks ago, "because this fabric is acceptable to all our requirements. We are relying on the pattern itself for style." A dark red plaid was selected for the green and metallic blue model, and a blue plaid for the grey model.

This synthetic material is resistant to rot, mildew, and moths, as well as grease, oil, alcohol and acids. A wipe with a damp cloth is all that is required to keep it clean. It is resistant to abrasion and, therefore, one of the most durable upholstery fabrics known. It is ideal for family cars that cater for children, animals, picnics and numerous other hazards. The colours are fadeless since the pigments are an integral part of the yarn.

Still considering the inside we made a survey of the current types of finish for fascia boards, instrument panels



This interesting model was on the stand of Robert Ingham Clark and Co. It shows stages in the pretreatment and finishing of Vauxhall car bodies in the primer-surfacer dip prior to entering the stoving oven.

and window and backlight mouldings. Here again, there have been many changes over the last few years. In the high-priced range the polished burr-walnut still holds pride of place; in the lower-price ranges, however, there is a trend to use the metal of the body structure and make no attempt to disguise it. The Ford Consul, for example, has quite a wide expanse of metal of the same stoved finish as the rest of the body, facing the driver. This is also the practice in the Morris, Austin and Vauxhall, whilst some of the cars in the intermediate-price group have gone over to moulded plastic facings and window framings.

There is nothing wrong, in our opinion, with the metal fascia provided there is not too much of it. We would all like burr-walnut or fancy wood veneers but, if cost rules them out, it is better to accept well-finished metal than possibly to have a revival of the once familiar wood-grained effect on the metal, which looked particularly shoddy and unnatural once it got rubbed or scratched.

Dust and draught-proofing techniques, whilst they do not strictly come under the purview of finishing, are of more than passing interest. In West Africa, laterite roads produce clouds of extremely fine dust in the dry season. This dust has been a plague to African motorists for years; it percolates everywhere—through door seals, through body seams, into the luggage boot.

Vauxhall engineers, sent to carry out an on-the-spot investigation of laterite dust, came back with this two-point programme:

(1) A new, fatter, more efficient rubber seal to doors, which effectively prevents the entry of any dust or draught.

(2) A new technique of sealing metal seams in the body and boot.

Because laterite dust is so fine, it penetrates the tiny spaces in the seams of a normal all-steel integral body. The cure has been to use pressure guns on the production line to apply more than 30 feet of special plastic composition to the body seams prior to final assembly and interior trimming.

Loose covers are another point of interest in the car world. Manufacturers report that the top favourites with the public are the various shades of maroon, dark red or wine colour. Other colours most often used are small and large checks in blue, brown, green and grey. An interesting newcomer was a range of tartan covers available in every single authentic Scottish Clan Tartan, and the firm had a "genealogical guide" available for the use of visitors who did not know to which clan they belonged.

Another new material was in an ocelot design; a kind of leopard-skin, with a flavour of the magnificent. Also on show was a special exhibit of craftsmanship in leather in the form of a pair of doors covered in leather and embossed in gold with a coat of arms on each centre panel, reminiscent of the special doors at Westminster Abbey at the time of the Coronation. This exhibit was staged by Connolly Bros. (Curriers) Ltd.

A thorough practical knowledge of this process enables us to supply a range of specially formulated hot-spray finishes.

It may be that you could use this process with advantage and if you would like to know more about its possibilities, we will gladly send a senior member of our Technical Staff for consultation and arrange a demonstration at our works.

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We must not omit to mention one other important development in connection with interior trim which has great possibilities in other directions. This is developed, with practical as well as visual qualities and is a completely new system of coating various materials with a layer of latex foam, which is completely integrated with the base. This is suitable for upholstery or carpeting. It was shown on the stand of Lintafoam Ltd.

As in previous years a number of the paint firms who specialise in motor-car materials had stands in the Accessories and Components Section. These firms included General and Industrial Paints Ltd., Docker Bros. Ltd., I.C.I. Ltd. (Paints Division), Thornley and Knight Ltd., and Pinchin Johnson and Co. Ltd. Most of these firms had special displays showing the part they played in the production of the modern motor-car, while panels, finished components, etc., were a feature of many stands.

An interesting feature on the stand of Robert Ingham Clark and Co. was a model (illustrated here) showing the stages from the transfer of body shells from the phosphate conveyor to the paint conveyor up to the entry into the primer surfacer oven. On the stand the model was supported by photographs taken at the Pressed Steel Co., Oxford and Vauxhall Motors Ltd., Luton showing their actual plants in action using Britannia materials.

Spray equipment was also a feature of the same section, and The Aerograph Co. Ltd., B.E.N. Patents Ltd., Air Industrial Developments Ltd. and F. G. Ruggles Ltd., had exhibits in this connection. A novel feature we saw was a complete garage kit for car valeting, including a vacuum cleaner, and the same company featured a new hot-air gun which can be used for quick drying of paint, or for drying-off beadings and crevices after washing, etc.

Specification Plating

WE have just received a copy of the current edition of a small booklet which will need no introduction to the older reader but will be of undoubted interest to the student and the newcomer to the finishing industry. We refer to the 21st edition of "The Electroplating and Metal Finishing Industry and the Epalex System" published by B. J. Round and Sons Ltd., of 8/9/10 Northampton Street, Birmingham, 18.

Following the format used in previous editions this booklet deals, in a concise manner, with all the processes of electroplating and metal finishing, and explains in clear and simple language the principle of the Epalex System of plating to a specified and guaranteed thickness, which has been a feature of B. J. Round's business for so many years.

The booklet, which is available from them on request, gives summaries of all the processes and brief details of the metals and types of deposit. The metal-finishing section of the booklet gives details of degreasing, descaling, shotblasting, lapping, scouring, polishing, bronzing and many other processes. Good, readable expositions of the principal pretreatment processes are included, also a set of tables of the Epalex plating thickness standards.

Industrial Clothing

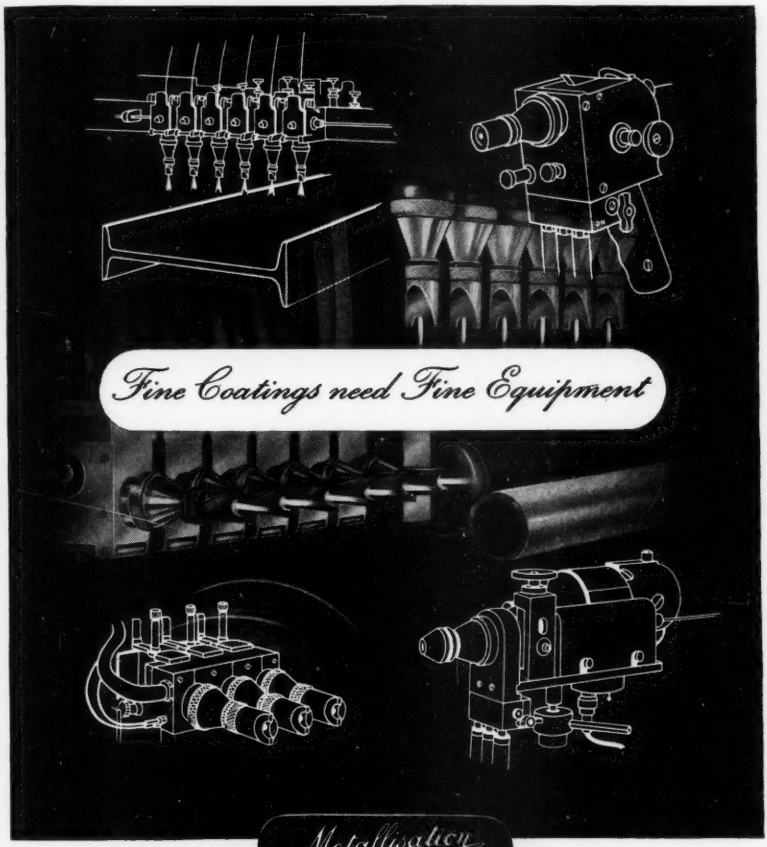
AS much as the sailor, soldier and airman must be dressed for the parts played in service life, so it is becoming increasingly recognised that industrial workers must be provided with the right kind of protective garments and the correct distinctive clothing for whatever job they do.

Uniforms and Industrial Clothing Catalogue, a new annual publication deals comprehensively with the complete range of service uniforms, general uniform wear and industrial clothing. It caters for those responsible for the purchase of all types of uniforms, overalls, protective wear, footwear, facewear, headwear, gloves, textiles and accessories. With the help of the fully illustrated Buyer's Guide, purchasing and indent agents can locate suppliers of almost any type of clothing equipment required.

The articles in this new annual present much practical information on how to make the right kind of purchases, quality points to look for, garment storage methods and information on the latest cloth and clothing tests carried out by service and industrial experts. There is also a simple guide to all the legal requirements for protective clothing and a list of testing laboratories which carry out examinations on cloth and clothing of all descriptions.

The new annual is published by United Trade Press Ltd., 9 Gough Square, Fleet Street, London, E.C.4, price 10s. per copy.

METAL SPRAYING BY THE WIRE PROCESS GIVES THE GREATEST PROTECTION AGAINST CORROSION



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Platinum in the Finishing, Jewellery and Metallurgical Industries

HOW important and widespread are the uses of the platinum metals, not only in finishing but in many other industries, was demonstrated at a recent exhibition organised by the Institution of Metallurgists. The exhibition commemorated the announcement in 1803 by William Hyde Wollaston of his discovery of the metal palladium, an announcement which took the unusual form of a handbill offering the metal for sale in a Soho shop.

Palladium was the second of the group of platinum metals to be discovered, platinum itself having been known since the sixteenth century. Rhodium was also identified by Wollaston, and osmium and iridium by Tennant, his English contemporary. Ruthenium was the last to be discovered in 1840 by Claus, a Russian chemist.

Many people think, mistakenly, that the platinum metals are used mainly for jewellery and luxury articles. In fact more than 75 per cent. of the total production of these metals goes to industrial applications. Their main uses result from their high melting points and great resistance to corrosion and oxidation. Workability, which varies greatly among the six metals of the group, also determines their respective fields of use. The two most abundant, platinum and palladium, are ductile and malleable. Rhodium and iridium, on the other hand, can be worked only with difficulty, and it is not yet possible to work ruthenium and osmium satisfactorily at all. Platinum and palladium are generally used in wrought form, ruthenium, osmium and iridium find their main uses as hardening additions to platinum and palladium, while rhodium, in addition to its use in platinum alloys, finds considerable application as an electro-deposited coating.

The exhibition was arranged in sections and showed:

The *history* of the platinum metals —particularly in relation to the metals palladium and rhodium. Many interesting documents and exhibits related to the discoveries of Wollaston.

Chemical Section: Applications of platinum, palladium and rhodium in the production of important industrial, medical and artistic products.

Electrical Section: The use of metals of the platinum group in very severe conditions and in many pieces of equipment where reliability is vital.

Metallurgical Section: Uses of these metals in measurement of high temperatures, analysis, and for crucibles and electric furnaces.

Artistic Section: Many beautiful and valuable exhibits, showing the application of the metals of jewellery, works of art, coins and medals.

The historical section included a collection of items connected with Wollaston and his discoveries and with the early history of the platinum metals. Pages from Wollaston's notebooks show the first reference to palladium by name against a date in 1802. A remarkable exhibit was the handbill mentioned above, which announces that "Palladium or New Silver, has these properties amongst others that shew it to be a new noble metal," and concludes "it is sold only by Mr. Forster at No. 26, Gerrard Street, Soho, London, in samples of Five Shillings, Half a Guinea, and One Guinea each."

Other noteworthy exhibits were a design for a palladium cup presented to Charles X of France in 1824 by Robert Breant, chief assayer to the Paris Mint, and an inventory, in Faraday's hand, made in 1834, of the platinum and palladium given to the Royal Society by Wollaston.

MANDER'S
INDUSTRIAL FINISHES

Full technical description on request to

MANDER BROTHERS LIMITED · WOLVERHAMPTON

A set of counterfeit "gold" coins made from gilded platinum, a reminder that platinum was once considerably less expensive than gold

Of earlier historical interest were photographs of jewellery made by American Indians before the time of Columbus. It is known that these primitive people had developed effective techniques for working alluvial platinum and gold which occur together in certain districts. As a crude form of gold refining the grains were melted with copper to give a gold-coloured alloy containing traces of silver and platinum. The platinum grains which could not then be melted were brought into workable form by heating it with small amounts of gold. Repeated heating and hammering yielded a homogeneous white alloy which was principally used for overlaying on gold.

Another exhibit in the same section was the set of counterfeit "gold" coins illustrated here. These coins were in fact made of gilded platinum, a reminder that platinum was once of considerably less value than gold.

The Bank of France issued a warning in 1878 concerning these coins, and describing in some detail the appearance of specimens that had recently come into their hands.

Before this, platinum had been used as a coinage metal in Russia, where, encouraged by rich platinum deposits in the Urals, the government of that country had in 1828 authorised the issue of three- six- and twelve-rouble pieces in platinum. The coins remained in circulation until recalled in 1846, when a considerable fall in the price of platinum in the Western markets led to counterfeiting and smuggling of false coins into Russia. Today the price of platinum at around £30 per ounce is two-and-a-half times that of gold.

It was explained to visitors that the names of the six platinum metals are:

Platinum, derived from the Spanish "platina," a diminutive form of "plata," meaning silver.

Palladium, from the name of a new planet, "pallas," discovered about the same time.

Rhodium, from the Greek ρδου a rose, because solutions of its salts are rose-red in colour.

Osmium, from the Greek υσμη a smell; the volatile oxide of the metal has a peculiar smell.

Iridium, from the Greek ιρισ a rainbow, because of the varying colours of the salts.

Ruthenium, from Latin Ruthenica, Russia: because the metal was first found in ores obtained from the Urals, and Russia was the native country of Claus, the discoverer.

The Chemical Section included exhibits showing the use of platinum metals in plating, chemical plant, production of glass and ceramics and as catalysts in certain chemical process operations.

Rhodium Plating

Rhodium, like the other metals of the platinum group, has great stability and resistance to corrosion and a high melting point. It is in fact more resistant to chemical attack even than

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platinum, and at normal and moderately elevated temperatures it is completely free from oxidation and tarnish. It is also very much harder and more resistant to wear than platinum, somewhat whiter in colour and has a higher reflectivity.

The preparation of rhodium in fabricated forms presents considerable difficulty and it is as an electrodeposit that it is most useful. Such deposits are used for parts of scientific instruments and radio apparatus to give permanent protection against atmospheric and marine corrosion, for certain types of electrical contacts and for reflecting surfaces such as instrument mirrors, cinema projectors and infra-red reflectors.

In the purely decorative field it is used to give a lasting and attractive finish for jewellery and silverware.

Rhodium can be directly deposited on to silver, copper, nickel, brass, nickel silver, phosphor-bronze, beryllium-copper and similar copper alloys, but not on to tin, lead, zinc, cadmium, aluminium, iron or steel. Where one of these latter metals is present a preliminary deposit must be applied, preferably of silver. In many cases, particularly for reflecting surfaces, it is desirable to apply this silver deposit in order to obtain the excellent polish which silver will take. Since no polishing is required after deposition the rhodium surface has the degree of polish given to the underlying material.

One of the most vital uses of rhodium plating is for searchlight reflectors, where the high reflectivity, resistance to accidental damage because of the hardness of the surface and its resistance to oxidation at intense heat has led to its ready acceptance as the standard reflector for this arduous service. Rhodium surfaces are immune from atmospheric tarnishing and are sufficiently wear-resistant to withstand routine removal of dust and oil without damage to the mirror finish.

Small quantities of other metals of the group may be alloyed with platinum when additional strength is needed. Alloys of palladium and gold, sometimes with the addition of platinum, provide a series of economical materials for use in dentistry. They

have high resistance to tarnishing and excellent mechanical properties. Certain of them, designed for severely stressed appliances can be hardened by heat-treatment, thus permitting free, accurate work in the unhardened state and a lighter construction than would otherwise be possible. Electrodeposited rhodium is often employed to give a completely tarnish-resistant finish to dentures.

Platinum metals are of importance, too, in the pen and pencil manufacturing industry. Alloys of metals of this group have been developed with both characteristic freedom from corrosion as well as great hardness for fountain-pen points. They are applied to the nib blanks in the form of pellets, which, after being soldered or welded into position, are slit and polished. Electrodeposited rhodium is used extensively as a hard-wearing and attractive finish for the external metal parts of pens and pencils.

Jewellery

Some fine examples of the arts of the jewellery craftsman were included in the exhibition, and perhaps the most noteworthy were a very fine rose bowl in palladium-rhodium presented to H.R.H. the Princess Margaret by the Institution of Metallurgists on the occasion of the opening of the exhibition "Metals in the Service of Mankind" in 1950, and a richly ornamented casket from Canterbury Cathedral of platinum set with diamonds.

The jewellery exhibits included a palladium tiara produced by the investment casting process, the rubber moulds, wax replicas and sections as cast being shown. The manufacturing jeweller today can call on a wide range of machine-made parts—or "findings," as they are known in the trade—which satisfy the great majority of his needs and require only a minimum of finishing work after assembly. By making use of these findings, the craftsman can greatly economise in both the time and labour which were involved when every individual component of a piece had to be formed by hand.

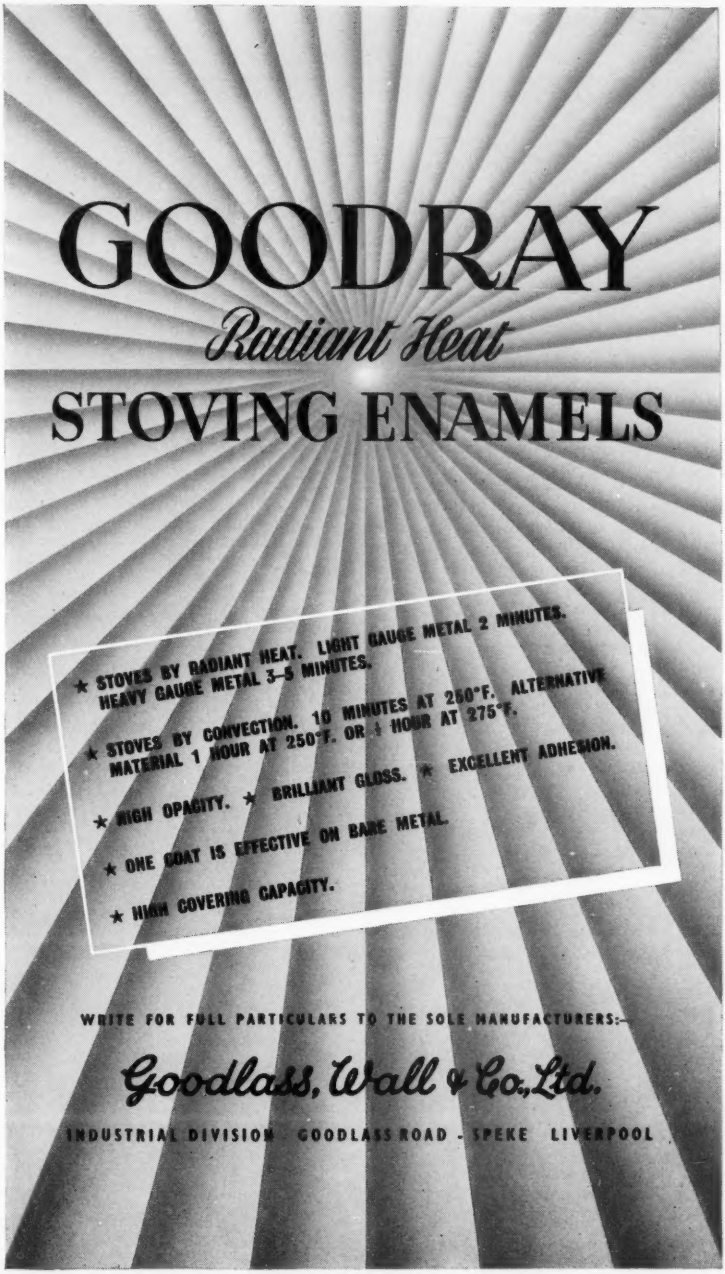
In modern electro-analytical practice platinum is almost invariably chosen for the construction of both anodes and cathodes. Its resistance to a wide range of reagents ensures inertness in operation and the ready removal of less noble metals. Platinum crucibles and dishes are employed for ignitions and fusions, especially when the residues are to be weighed in the same vessel. In addition to the resistance which platinum offers to most acids, it is unaffected by a wide variety of fluxes; it has high melting point, a low heat capacity and can be heated strongly in air without change of weight due to oxidation.

Electrical

Although small in size, the part played by electrical contacts in the functioning of equipment is vital. While failure of contacts may cause no more than inconvenience, there are extreme cases as, for example, in protective devices or railway signalling systems, where the consequences could be fatal.

While the choice of materials is governed by many electrical and metallurgical factors, resistance to all forms of corrosion is probably of the greatest importance. The formation of non-conductive oxide films will cause high contact-resistance and, as a result, the contacts may fail to make at all unless the film can be broken through by sufficient pressure or by a wiping action. The chemical inertness of the platinum metals thus makes them ideally suited for use where contact pressures must be very light. Both platinum and palladium are in general use, but small percentages of other metals of the platinum group are sometimes introduced as hardeners for specific applications. Typical examples of the use occur in instruments and radio-frequency and sensitive relay contacts on which there is no appreciable wear by arcing and also sliding contacts which do not interrupt current. When electrical and mechanical conditions become more severe, one of the harder alloys of platinum with iridium or ruthenium is chosen in order to provide higher resistance to wear.

Rhodium is another useful material for contacts as its immunity from film formation gives it a very stable, low contact resistance. Usually it is employed in the form of an electrodeposited coating, in which state it is extremely hard. Typical applications include contacts on fire detector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switches, contacts of high-frequency valves and switches handling radio-frequency currents where wear is severe and long idle periods may occur under corrosive conditions.

Electrodes

Platinum electrodes are extensively used in the field of electrolytic oxidation, because of their resistance to acid attack and high oxygen over voltage. Processes of this type include the manufacture of perborates, perchlorates and persulphates. Many designs of electrode have been developed, the essential problem being the provision of adequate current-carrying capacity with the maximum effective area of metal per unit weight.

Thermocouples

Measurement of temperatures by means of thermocouples has long been regarded as commonplace. For the very high temperatures—up to 1,700° C.—no other combination of alloys is so successful as platinum for the one wire of the pair and an alloy of platinum and rhodium for the other.

Both platinum and its alloys with rhodium possess in an outstanding degree the physical attributes requisite for this application—high melting points, resistance to oxidation at high temperatures and good working properties. So constant is the calibration of platinum to platinum-rhodium thermocouples that they are accepted as the International Standard for temperature measurement between 630·5 and 1,063° C. A recent introduction is the platinum −20 per cent. rhodium alloy/platinum 40 per cent. rhodium alloy thermocouple which will measure temperatures up to 1,900° C., i.e., above the range which can be dealt with by the Standard thermocouples.

Artistic and Decorative Uses

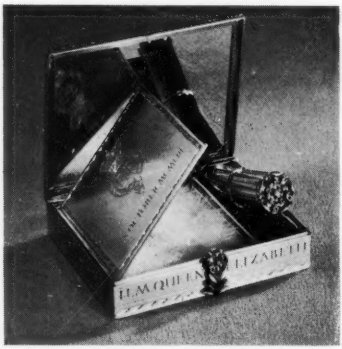
The exhibition demonstrated the many applications of the platinum metals in scientific, industrial and decorative work, and included some very fine examples of bookbinding in leather with hand-tooled designs in palladium leaf. Palladium can be beaten into leaf by a process similar to that practised for centuries with gold, and it offers the designer of fine bindings a metal which can be used either in place of or in association with gold leaf to produce rich and beautiful effects.

The colour of palladium is indistinguishable from that of the better known platinum. It can be applied to bindings in leather or cloth, as well as to cover papers and boards. It can be used, too, for edging pages of books, playing cards and similar printed matter.

For decorative purposes in pottery, "liquid bright platinum," a colloidal solution containing platinum and other precious metals, applied as a varnish and subsequently "fixed" by firing to give a permanent silver-white film, is used to produce pleasing decorative effects on glass and porcelain.

Unique Powder Box

WHEN H.R.H. the Duke of Edinburgh opened the Platinum Metals Exhibition last month he accepted, on behalf of H.M. the Queen, a unique powder box, the gift of the Institution of Metallurgists.



This powder box is made entirely of metals of the platinum group, with platinum and palladium predominating and rhodium, iridium, ruthenium and osmium used in their normal roles as hardeners of platinum and palladium. It has thus been possible for the metallurgical attributes of various alloys to be exploited to the full in producing a finely balanced construction weighing approximately 8½ ounces troy (about 265 grams). The production involved critical selection of metal gauges to secure relative lightness of the finished article but, at the same time, to obtain the rigidity required for

AN INVITATION

To individual readers: The Personal Reader Service Section facing page 264 is for your use and convenience, do you make use of it?

To firms interested in finishing shop supplies: You are invited to send in material suitable for inclusion in the above feature, there is no charge for this service and it is operated in our mutual interest.

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On this same plant, a Brown ElectroniK Circular Chart Controller is incorporated to maintain temperatures at the desired level. Brown ElectroniK "Continuous-Balance" Potentiometers are available for indicating, recording and controlling. Their sensitivity and speed of response ensure the detection and automatic adjustment of the slightest temperature fluctuations. Application and Specification Bulletins are available on request. *British Made Patent Specification 436,098.*

Photographs by courtesy of the North British Chemical Co. Ltd., Droylsden, Manchester.

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indefinite serviceability. Throughout the assembly the finest grades of platinum and palladium solders have been used in making the joints.

The predominating feature of the box is the top cover. This is made from a hard stiff alloy containing 80 per cent. platinum and 20 per cent. iridium. The delicate work of producing the various motifs involved 1,000 individual hand piercing operations, some of them made with saws that were almost of hairlike thickness.

The body of the box and its main internal sections are made in a light and strong 80 per cent. palladium-20 per cent. rhodium alloy with a whiteness of colour matching the platinum-iridium alloy.

The decorative jewel-like motifs incorporated in the fastener of the box and in the top face of the lipstick are in the regular 95.5 per cent. palladium-4.5 per cent. ruthenium jewellery alloys. Long experience with this composition in the jewellery field has enabled these complex designs to be delicately reproduced.

For the "catch" of the fastener of the powder box and the thorns on the rose emblems of the lipstick and fastener, the very hard osmiridium composition of the type used for pen points was selected.

Aside from hardness, durability and workability, attention has been paid in the selection of the materials to their response to taking fine finishes and being fitted to close tolerance. This is seen in the smooth actuation of the various moving parts of the box and the almost "optical fits" that have been realised in order to get this precision and to ensure powder-tightness.

The powder box was designed by Mr. Stephen Gooden, C.B.E., R.A., and the execution of the design was entrusted to the firm of D. Shackman and Sons Ltd. (under the direction of Mr. Reuben Shackman). Seven specialised craftsmen worked on the creation, including Henry Wilkinson of the City and Guilds College Art School, who was responsible for the whole of the engraving and lettering.

Zinc Spraying on Jubilee Bridge

AN interesting sand-blasting and zinc-spraying contract has been in operation during the summer months of this year at Barrow-in-Furness. This is the Jubilee Bridge which connects Walney Island with the town of Barrow-in-Furness on the mainland.

Constructed from steel on concrete pontoons, the bridge is the Bastille type with nine spans to a total length of 1,123 ft. There is a 20-ft. roadway with pavements for foot passengers.

The water is tidal with a maximum tide of some 30 ft. None of the steel is immersed, but it is subject to severe marine atmospheric conditions and it has been found that painting alone will not stop corrosion except on small sheltered areas.

It was, therefore, decided by the Barrow Council on the advice of the consulting engineers, Messrs. Freeman Fox & Partners, that Schori sprayed zinc coatings should be used as a permanent rustproof undercoating to the paint.

Schori Metallising Process Ltd. have been nominated main contractors for the work. This consists of sandblasting to bare steel and zinc spraying to a thickness of ·002 in. followed by zinc chromate primer paint and two finishing paint coats on 164,000 sq. ft. of surface.

Five spans have been completed during the summer months of this year and the remaining four spans will be done during the same period in 1954. Sixteen men are employed and sandblasting is carried out until 3 p.m. each day, at which time the sprayers take over and zinc spray the work on the same day. These operators do their own labouring and work under the supervision of one resident foreman.

Eight air compressors are at work on the site, each delivering 170 cu. ft. of free air per minute for the Schori shotblast machines and Schori Model 50 pistols. To complete the contract, approximately 1,000 tons of sand and 10 tons of zinc powder will be used.

The sand in sacks is fed down metal chutes to the shotblast machines which work from tubular scaffolding. About half the sand is recovered after blasting and re-used. Throughout the operations the bridge will carry its normal road and passenger traffic.

BRITISH STANDARDS of Interest to FINISHERS

THE following new B.S.S. have been issued and are now available from British Standards House, 2 Park Street, London, W.1:

B.S. 558 & 564: 1953 Nickel anodes and nickel salts for electroplating, 4s.—Specifies composition and limits of impurities and includes methods of analysis. The salts covered are nickel ammonium sulphate, nickel sulphate and nickel chloride.

B.S. 1224: 1953 Electroplated coatings of nickel and chromium, 2s. 6d.—Covers coatings of nickel and chromium on steel, copper, copper alloy, zinc alloy.

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It gives limits of finish, thickness and adhesion and specifies a salt spray test. Appendices give methods of carrying out the tests.

B.S. 2039: 1953 Enamelled round copper wire (enamel with vinyl acetal base) metric units, 4s.—This is similar in all respects to B.S. 1844: 1952 except that all quantities are expressed in metric units. It specifies the requirements for round copper wire, insulated with a synthetic enamel based on a vinyl acetal resin. All sizes of wire from 0.050 mm. to 4.00 mm. diameter commonly in use are included. There are four classes differing in the thickness of insulation, and the classes are designated Fine (F), Medium (M), Thick (T) and Extra Thick (X) respectively. It specifies details of the enamel, insulation, elongation of the enamel wire, continuity of covering, and gives methods of test for the measurement of conductor diameter and overall diameter, hardness of enamel, electric strength, continuity of covering, together with a table of preferred sizes of conductor, and the diameters of the covered wires.

Scrib Anodising Ltd., who specialise in bright anodising of quantities of small aluminium parts, have now entered their third year and they tell us that their Brimsdown, Middlesex, factory has treated several million components to a high standard of workmanship. The most popular process has proved to be the electrobright gold anodising used for the fountain pen, watch case, jewellery and dressware trades. Another speciality is the treatment of large quantities of fine chain for jewellery use. The A.I.D. approved technical section is also currently very busy on aircraft and radio parts.

The Parkinson and Cowan Group of companies is well known for its production of domestic appliances and the Parkinson and Cowan Gas Meters section is equally well known for its production of industrial heating apparatus. The growth of these activities has now made it necessary for the firm to establish a new division of the Group to foster them. This division will be known as Parkinson and Cowan Industrial Products and will operate from Cottage Lane Works, City Road, London, E.C.1.

Vacu-Blast Ltd., the manufacturers of the Vacu-Blast portable shot blast equipment, announce the formation of a subsidiary company known as Vacu-Blast Contractors Ltd. The new company offers a country-wide shot blasting service on a contract basis. This service must appeal to firms who have paint maintenance, corrosion and general shot blast cleaning problems. The address of the new company is: Vacu-Blast Contractors Ltd., 291 Aberdeen Avenue, Slough, Bucks. Telephone: Slough 24507.

LETTER TO THE EDITOR

(*The Editor,* INDUSTRIAL FINISHING.)

SIR,—I am the instructor in coachpainting at the North Staffs Technical College and a subscriber to INDUSTRIAL FINISHING.

As you will probably know, there is no certificate for coachpainters, this subject being merely a part of the Certificate for Body Building of the City and Guilds Institute. I have been making efforts for the creation of a form of Certificate by some responsible body but have had no success up to the moment.

Now, to my mind, there is as much skill in a workman who can take a vehicle from start to finish, either in cellulose or synthetics, and can also carry out the lettering, etc., as there is skill in joinery, plumbing, building, etc. You will know, of course, that at the technical college these other subjects are all awarded a trade certificate, something that can be shown to a prospective employer, but a coachpainting student has nothing to show. I have been making efforts to rectify this, but without success.

I think that you will agree with the above, and so I wonder if it would be possible for you to insert a paragraph in the next issue, asking if other of your readers would care to write to the address below, giving their experience, so as to try some other form of action in obtaining some form of trade recognition or educational certificate.

Thanking you,

Yours sincerely,

S. GUEST.

52 Somerville Avenue,
Basford,
Newcastle-under-Lyme,
Staffordshire.

This is a point we have taken up more than once. Special classes are held, and certificates issued, for painting and decorating, but not for industrial finishing—an equally important and much more technical subject. Would interested readers please get in touch with Mr. Guest?

PARKINSON & COWAN INDUSTRIAL PRODUCTS

THE Parkinson and Cowan Group is well known for its production of domestic appliances, meters and instruments. It also produces a large volume of industrial equipment. In particular, Parkinson and Cowan Gas Meters operates a rapidly developing business in industrial heating apparatus, notably in infra red drying equipment. The growth of these activities makes it necessary to establish a new Division of the Group to foster them. This Division will be known as

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NEW BRITISH STANDARDS HEADQUARTERS

THE British Standards Institution recently held an "At Home" to members and the Press at which we had an opportunity of inspecting the new headquarters of the Institution.

The move of B.S.I.'s many scattered departments from what had been described in a Government Report as the "rabbit warren" of offices in Victoria Street and Gillingham Street took place at the beginning of August, and in spite of the complexity of the job, it involved remarkably little interruption in B.S.I.'s normal services to members. After some two months in occupation the great advantages of the central and well-planned eight-floor building are becoming more apparent.

From members' point of view the new premises offer greater convenience—in the form of more and better committee rooms, and easier access to B.S.I. personnel and to such key sections as the Sales Branch and the Library.

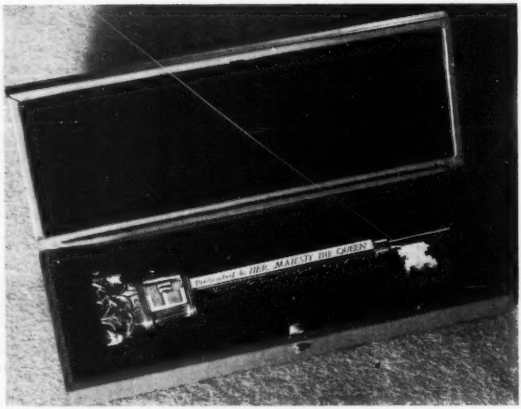
The full effect of all these advantages is seen in better and speedier service to those thousands of people in industry and commerce who are the core of B.S.I.'s membership and the actual producers of its most effective work. Considering how much has been gained on all sides by the move, it seems almost incredible that the floor space now occupied is but little greater than it was in the old premises.

Not the least interesting part of the move is the way in which a building designed for luxury residential purposes has been adapted for use as a strictly utilitarian and efficient office unit. The extensive conversion necessary was carried out by the owners of the building exactly to B.S.I.'s requirements and under the supervision of the Institution's own architect, Mr. Rowland Pierce.

COMMONWEALTH AIR FORCES MEMORIAL, RUNNYMEDE

THIS key was presented to Her Majesty The Queen by Edward Maufe, R.A., architect of the Air Forces Memorial at Runnymede. It was made to the architect's design by J. Starkie Gardner Ltd., metal craftsmen, who also made the nickel-silver entrance gates of the memorial.

The shank and wards are made from wrought palladium-ruthenium alloy, similar to the alloy used for the finest jewellery. The Air Force Crown was cast in the same alloy and hand-chased. The Royal cipher is inlaid in gold.



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NAMES IN THE NEWS

Appointments

As we go to press with this issue of INDUSTRIAL FINISHING we hear that **Mr. W. E. Cattley** has been appointed Sales Manager of The Walterisation Co. Ltd.

Mr. H. Melrose, A.M.I.E.E., of the Technical Department of Barlow-Whitney Ltd., industrial heating engineers, London and Bletchley, has been appointed as district engineer and manager, Midlands area, following the retirement of **Mr. J. Hearn Noble.** Mr. Melrose will operate from the company's new office at 6/8 Holloway Road, Birmingham, 1.

Mr. William James Deverall, B.Sc., A.M.I.Chem.E., works manager, Joseph Crosfield & Sons Ltd., has been appointed a director of Joseph Crosfield & Sons Ltd., and of William Gossage & Sons Ltd. Recently Mr. Deverall was appointed a member of the Association of British Chemical Manufacturers' Manchester Area Committee on "Productivity in the Heavy Chemicals Industry."

Dr. Wallace Rubin has been appointed chief chemist to Kelsey Industries Ltd., and its associated companies, in succession to **Dr. P. M. Fisk,** whose resignation was recently announced. He joined Kelsey Industries Ltd. nearly a year ago. Previously he was associated with Cellon Ltd., and Petrochemicals Ltd.

The Paints Division of Burt, Boulton & Haywood Ltd., announce that **Mr. H. Brailsford** has been appointed sales manager. Formerly he was sales manager at Sir W. A. Rose & Co. Ltd., and prior to that was for a number of years with Donald Macpherson & Co. Ltd., on the technical side at their Manchester works.

Mr. Martin Apley has left Catalin Ltd., Waltham Abbey, Essex, to join the Walker Extract and Chemical Co. Ltd., of Bolton, Lancs., as development manager and director. Mr. Apley has been chief chemist of Catalin Ltd., since its formation in 1937.

Mr. G. H. Duncan and **Mr. E. J. Farrar** have been appointed to the board of directors of Commercial Solvents (Gt. Britain) Ltd.

Mr. L. H. Coney has been appointed Lubricants Co-ordinator of Shell-Mex and B.P. Ltd., responsible directly to the company's general sales manager, Mr. A. M. Mackintosh. Mr. Coney was manager of the Cardiff Division during 1948 and manager, Western Division during 1950, for the last two years he has been at Head Office.

Mr. J. C. M. Petrie has been appointed to the board of International Paints (Holdings) Ltd., to fill the vacancy created by the death of Mr. R. H. Lawson.

Travelling

Mr. John H. Lawrence, Managing Director of Jenolite Ltd., recently left this country for a tour of India, Malaya, Australia, New Zealand and U.S.A. Main object of the trip is to open up new markets in India and Malaya and to visit Jenolite distributors in Sydney, Auckland, San Francisco and in Cleveland (Ohio). Mr. Lawrence will also try to obtain U.S. Government approval for new processes in America. At the same time Jenolite Ltd. announce the appointment of new agents in British North Borneo, Brunei State and Sarawak. They are Messrs. Ker-Lindsay (Far East) & Co., of Kuala Belait, Brunei State, British Borneo.

Obituary

We announce with deep regret the death early last month, of **Mr. Richard W. Bedford, M.B.E.,** for many years works manager of George Kent Ltd.'s factory in Luton. A production engineer of the first order, Mr. Bedford joined Kent's in June, 1904, and moved to Luton from London when their new works were opened in 1908. By shortly after the end of the 1914-1918 war he had been appointed to assume the works managership. Perhaps his most outstanding achievement was the organisation of the firm's return to normal production after that war.

Mr. William Smith, F.R.I.C., head of the Research Department, I.C.I. Ltd., Dyestuffs Division, Grangemouth, died on 18th October last.

Rushtons (Leeds) Ltd. announce that the name of the firm has now been changed to Roundhay Metal Finishers (Leeds) Ltd., the address remains as before, viz.: Olympia Works, Roundhay Road, Leeds, 8.

A Lecture entitled "Colour Today" was given by Mr. R. F. Wilson, Art Director of the British Colour Council, on Wednesday, 28th October to an invited audience at the Textile Institute, 10 Blackfriars Street, Manchester.

A. P. Skelton Ltd. ask us to state, in connection with the article "New Paintshop Layout at Marconi Factory," in our August issue, that they designed, manufactured and supplied the entire Plenum plant and duct work in that plant to the specified requirements of T. C. Spray Finishing Systems. No reference was made to this point in the article concerned as we were unaware of it at the time of publication. We also wish to point out that the correct title of the firm is A. P. Skelton Ltd., not Richard Skelton as previously reported.

The Exhibition Panel Service, formerly of Frobel House, Church Street, Warwick, have moved to more commodious premises at 10a Swan Street, Warwick. They inform us that they are offering a greatly increased service at the new address including silk screen work. The telephone remains as before: Warwick 916.

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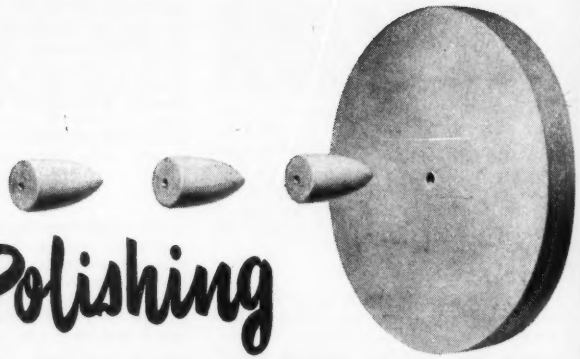

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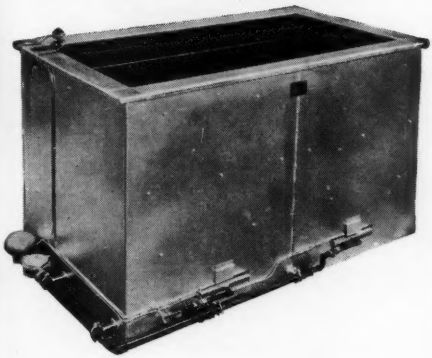

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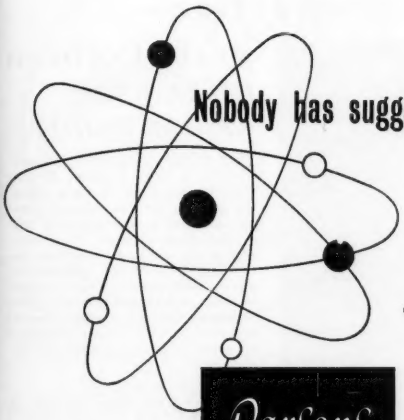

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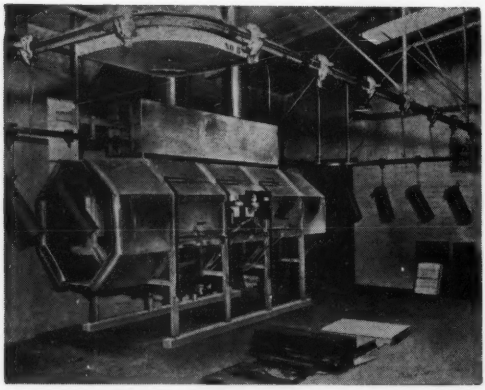

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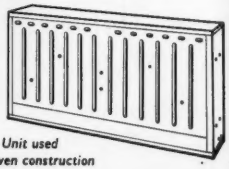

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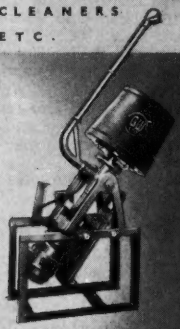

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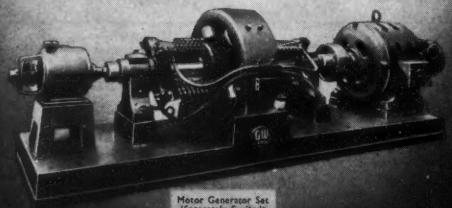

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